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Improving the knowledge on Romanian Rhopalocera, including the rediscovery of *Polyommatus amandus* (Schneider, 1792) (Lycaenidae) and an application of DNA-based identification

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Abstract. From May 19th to June 8th of 2007, the authors undertook lepidopterological research in 29 localities in Romania, several of which are poorly or totally unstudied from a lepidopterological point of view. 105 taxa were identified, out of which seven receive special attention in the text, with comments on their distribution, ecology and conservation status. *Polyommatus amandus* (Schneider, 1792) (Lycaenidae) is recorded for the first time in Romania after 28 years. We provide the first record from Muntenia for *Cupido* (*Everes*) *decolorata* (Staudinger, 1886) (Lycaenidae), and the third known Romanian location for *Pseudophilotes bavius egea* (Herrich-Schäffer, 1852) (Lycaenidae). Lepidoptera DNA-based identification was used for species identification based on larval stages. This technique confirmed the discovery of *Zerynthia polyxena* ([Denis & Schiffermüller], 1775) (Papilionidae) in southern Dobrogea and its rediscovery in the entire province after 80 years.

Introduction

Although the Romanian butterfly fauna has been studied for more than 150 years (e.g. Fuss 1850; Franzenau 1852, 1856, 1859; Mann 1866), there are still large gaps regarding the distribution and conservation status of many of the species known to occur within the country's territory. The newest version of the Catalogue of the Romanian Lepidoptera (Rákosy et al. 2003) reflects the knowledge for Romania's main historical regions, which turn out to be very unequally studied, with the greatest gaps in the southern parts of the country. Moreover, a considerable amount of faunistical data was published decades ago and for many specific locations there is no new data available on Lepidoptera, making an objective assessment of Romania's species distribution and conservation status very difficult. This is of particular importance now, as the country joined the European Union and conservation-oriented actions are more accessible (but also more necessary) than ever.

The main goals of the present study are to improve the knowledge regarding the Romanian butterfly fauna and to point out the natural capital of several of the country's areas, which are little known to European biologists. Special attention is given to seven taxa considered of particular importance, including original distribution data and aspects related to their conservation status. In addition, Lepidoptera DNA-based identification is used as a means of precise species identification during larval development.

Abbreviations

bp	base pairs
CI	consistency Index
COI	cytochrome oxidase subunit I
COII	cytochrome oxidase subunit II
DNA	deoxyribonucleic acid
dNTP	deoxynucleoside triphosphate
HPLC	high performance liquid chromatography
MP	maximum parsimony
PCR	polymerase chain reaction
RI	retention Index
RV	Roger Vila
TBR	tree bisection reconnection
TL	tree length
tRNA-leu	leucine-transfer ribonucleic acid
VD	Vlad Dincă

Material and methods

Collecting. The field research was undertaken in the interval May 19th – June 8th of 2007 and covered various regions of Romania (Fig. 1). Most of the collecting was made using insect nets, but in several cases we also looked for preimaginal stages. When considered necessary, we preserved material for DNA studies, in which case the insect body was kept in 100% ethanol vials, and the wings inside glassine envelopes as reference. All samples are stored in RV lab's DNA and Tissues Collection at Universitat Autònoma de Barcelona.

Several specimens of *Carcharodus*, *Pyrgus*, *Pieris, Leptidea* and *Melitaea* where identified through genitalia examination. The systematics used follows that of the Catalogue of the Romanian Lepidoptera (Rákosy et al. 2003), with the exception of the misspelled genus name *Plebeius* Kluk, 1780 that we replaced with the correct *Plebejus* according to Bálint et al. (2001).

Specimen sequencing. Total genomic DNA was extracted using Chelex 100 resin, 100-200 mesh, sodium form (Biorad), following the protocol of Walsh, Metzger and Higuchi (1991). The following samples were extracted: *Zerynthia polyxena* ([Denis & Schiffermüller], 1775), Romania, Constanţa County, Canaraua Fetei, 22.v.2007, RVcoll.07-D023 (collected as last instar larva); *Z. polyxena*, Romania, Buzău County, Dănciuleşti, 20.v.2007, RVcoll.07-D396 (collected as last instar larva); *Allancastria cerisyi ferdinandi* Stichel, 1907, Romania, Constanţa County, Canaraua Fetei, 23.v.2007, RVcoll.07-D031 (collected as adult).

A 650 bp fragment at the 5' end of the mitochondrial gene cytocrome oxidase subunit I (COI) was amplified by polymerase chain reaction using the primers LCO 1490 (5' -GGTCAACAAATCATAAAGATATTGG-3') (Folmer et al. 1994) and Nancy (5' -CCCGGTAAAATTAAAATATAAACTTC-3') (Simon et al. 1994). Double-stranded DNA was amplified in 25 µl volume reactions: 17.65 µl ultra pure (HPLC quality) water, 2.5 µl 10X buffer, 1 µl 100mM $MgCl_2$, 0.25 µl 100 mM dNTP, 1.2 µl of each primer (10 mM) and 0.2 µl Taq DNA Polymerase (Bioron, GmbH). The typical thermal

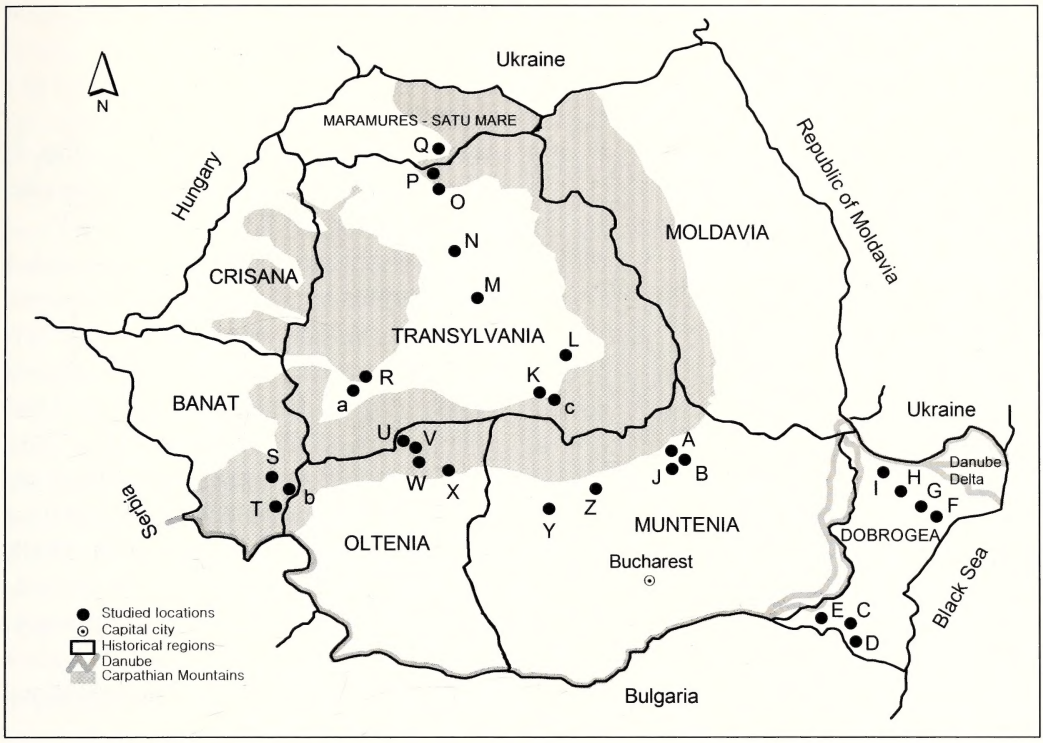

Fig. 1. Studied locations from May 19th to June 8th of 2007. Letters for each locality refer to those in Appendix 1.

cycling profile, carried in a PTC-100 Peltier Thermal Cycler, was 95 °C for 60 seconds, 44 °C for 60 seconds and 72 °C for 90 seconds, for 35 cycles. PCR products were purified and sequenced by Macrogen Inc. (Seoul, Korea).

Sequence analysis. The sequences were edited and aligned using Sequencher 4.2 (Genecodes Corporation, Ann Arbor, MI) and MacClade 4.05 (Maddison & Maddison 1992). The fragments were of equal length and alignments unambiguous. Primer sequences were cropped and missing data and ambiguities were designated by the letter "N". All sequences were submitted to GenBank (codes EU667423 to EU667425).

Available GenBank COI sequences overlapping with the fragment sequenced by us and belonging to *Zerynthia* (DQ351039, AF170870), *Allancastria* (AF170869, DQ351040 to DQ351043) and *Buthanitis* (DQ351036 to DQ351038) were included in our analysis. For details regarding these samples, refer to Nazari et al. (2007). The three *Buthanitis* taxa were selected as outgroup and as root for our analysis, based on the results of Nazari et al. (2007). The phylogenetic analyses of the DNA data was conducted in PAUP* 4.0b10 (Swofford 2001) under the maximum parsimony (MP) criterion. Heuristic searches were conducted for MP analysis with all characters equally weighted and under the TBR swapping algorithm with 10000 random addition sequences. The parsimony hypothesis was evaluated by bootstrap analysis (Felsenstein 1985) with 1000 pseudo replicates under the same parameters as the initial parsimony searches, except for using 1000 random addition sequences.

Fig. 2. Last instar larva of *Z. polyxena* on *Aristolochia clematitis* at Canaraua Fetei, 22.v.2007. Photo V. Dincă.

Results and discussion

Zerynthia polyxena ([Denis & Schiffermüller], 1775) Fig. 2

Material. 5 terminal instar larvae, **Romania**, Constanţa county, Canaraua Fetei, 22.v.2007.

Although this species has been recorded from various localities distributed across Romania (Rákosy et al. 2003), only two very old records exist from Dobrogea (south-eastern Romania) (Mann 1866 –surroundings of Tulcea– and Fiebig 1927 –locality not specified). Therefore it was considered to be possibly extinct in this region (Rákosy & Wieser 2000). Moreover, *Z. polyxena* was never recorded from the southern part of the province, which is relatively well studied from a lepidopterological point of view (Rákosy & Székely 1996).

During the spring of 2007, we managed to find several larvae in southern Dobrogea (Canaraua Fetei) (Fig. 2), which we tentatively attributed to *Z. polyxena*. The larvae were found feeding on *Aristolochia clematitis* L. (Aristolochiaceae) (which is well represented in the area) and were collected in order to be reared. A few days after collecting, one larva manifested signs of disease and therefore it was preserved in 100% ethanol. The others reached the stage of prepupa or pupa without problems and had to be transported by plane from Romania to the laboratory in Spain where the rearing process was to be continued. During the flight, the luggage containing the larvae was severely damaged and the recipient with the larvae was lost.

The area of Canaraua Fetei is well known for being one of the few locations in Romania where *A. cerisyi ferdinandi* flies (Rákosy & Székely 1996), a species with quite variable larvae, sometimes fairly similar to *Z. polyxena*, which also uses *A. clematitis* as larval food plant. Furthermore, the lack of adult specimens might cast doubt on the record, especially in the eyes of some Romanian lepidopterists for whom the famous area of Canaraua Fetei is a "classical" place for *A. cerisyi*, but certainly not one for *Z. polyxena*. As a matter of fact, doubts on the veracity of our record were expressed by some colleagues who bred larvae of *A. cerisyi* from Canaraua Fetei and noticed that some are similar to those of *Z. polyxena*. Therefore, in order to confirm our record, we decided to use DNA-based methods as a tool for precise species identification. This was possible because of the larva preserved in ethanol (RVcoll.07-D023), for which a 650 bp COI mitochondrial fragment was sequenced and compared to those of a sympatric *A. cerisyi*

ferdinandi (RVcoll.07-D031) and a Romanian specimen of *Z. polyxena* (RVcoll.07-D396) from one of the closest known populations (Buzău county, Dănciuleşti – about 150 km far). The putative *Z. polyxena* sample from Dobrogea presented an uncorrected "p" distance of only 0,15% (1 base-pair difference in a 650 bp fragment) compared to *Z. polyxena* from Dănciuleşti. On the other hand, the distance with the sympatric *A. cerisyi ferdinandi* was 6,92% (45 differences in 650 bp). Since a phylogenetic tree based on COI sequences that includes all the species of *Allancastria* and *Zerynthia* from the Palaearctic region exists in literature (Nazari et al. 2007), we included our sequences in the COI dataset and reanalysed it with Maximum Parsimony. The resulting tree (Fig. 3) has the same topology as that of Nazari et al. (2007). The Romanian *A. cerisyi ferdinandi* sample pairs with the other representative of the same species with good support. Both the Romanian *Z. polyxena* and the enigmatic Rvcoll.07-D023 sample form a strongly supported clade with *Z. polyxena* from Russia. These results confirm the identification of the larva from Canaraua Fetei as *Z. polyxena* and demonstrate the usefulness of our DNA-based approach within this group of taxa.

This result represents the first record of *Z. polyxena* from southern Dobrogea, as well as its rediscovery in the entire province after 80 years. With the current data, it is virtually impossible to know whether the species has been surviving in south-western Dobrogea for a long time or if it has recently colonized the area. The possibility of a permanent population is in our opinion reasonable because:

- although old, previous records from Dobrogea do exist (Mann 1866, Fiebig 1927);
- its historical presence in Dobrogea would logically complete its distribution in Eastern Europe as it is mentioned as widespread from the Republic of Moldavia and most of Ukraine (both bordering Romania in northern Dobrogea) (Tshikolovets 2003), as well as from Bulgaria where the nearest records to southern Dobrogea are located less than 70 km away (Abadjiev 2001);
- the larval food plant is well represented in parts of southern Dobrogea;
- *Allancastria cerisyi* and *Z. polyxena* sometimes fly in the same locations without excluding each other (e.g. Belasitsa and Skakavitsa in Bulgaria) (Abadjiev 2001).

Canaraua Fetei is a protected area consisting mainly of xerophilous *Quercus* forest (*Q. cerris* L., *Q. pedunculiflora* Koch) and clearings, plus several karstic areas which shelter a characteristic flora and fauna. Many of these taxa are of great conservation significance at national and European levels.

Zerynthia polyxena is protected by law in Romania and is considered as endangered in the Romanian Red List for butterflies (Rákosy 2003). This adds a new taxon to the list of protected butterfly species known from Canaraua Fetei: *Pyrgus sidae* (Esper, 1784), *A. cerisyi ferdinandi*, *Euchloe ausonia* (Hübner, 1804), *Apatura metis* Freyer, 1829, *Lycaena dispar rutila* (Werneburg, 1864) and *Pseudophilotes bavius egea* (Herrich-Schäffer, 1852) (Rákosy & Székely 1996).

During the field trip, we recorded two new populations of *Z. polyxena* in Muntenia (Valea Mare – Dâmboviţa county, and Dănciuleşti – Buzău county) (Appendix 2), a

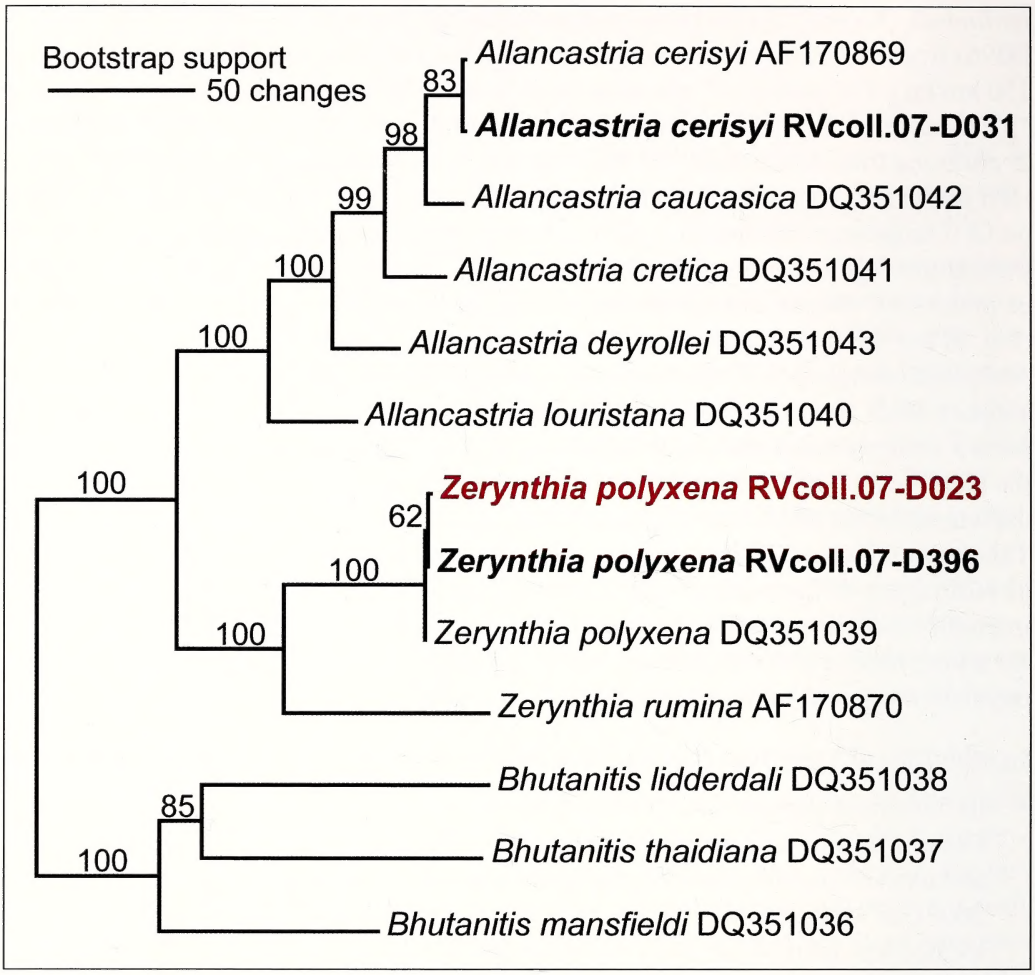

Fig. 3. Maximum parsimony (MP) tree of *Allancastria* and *Zerynthia*, with *Bhutanitis* as outgroup, inferred from 2306 bp of COI+tRNA-leu+COII (only 650 bp of COI for the Romanian samples). One best tree, TL = 685, CI = 0.746 and RI = 0.715. In red, the sample collected in southern Dobrogea; in bold, samples from Romania used as comparison. Bootstrap values are shown above recovered branches.

region from where the species has few and rather obsolete records (Niculescu 1961). These observations together with previous records from the Subcarpathian hills of Muntenia strongly suggest that *Z. polyxena* might be much more widespread than previously suspected in this vast region of the country. The population from Dănciuleşti seems to be particularly vigorous as a rather fast inspection of the many *Aristolochia* present there allowed us to observe dozens of larvae on just a few square meters.

The distribution of *Z. polyxena* is closely linked to the areas where *A. clematitis* occurs. This plant is fairly localized and it is often associated with neglected vineyards or abandoned agricultural fields which may be subject either to natural vegetation succession (habitat closure) or to other economical uses (rehabilitation, construction, etc.). For example, at Dănciuleşti the plant is abundant, but restricted to a recently abandoned

agricultural field that is probably private property and might at any time be completely transformed for various purposes. At Călan and Valea Mare the plants occur just next to the main road (1–2 meters away) next to small ditches, while at Valea Călugărească the adults were observed flying among the railways. All these areas experience high antropic pressures. On the other hand, the plant is generally considered as a weed and therefore people try to eliminate it. As a matter of fact, *Z. polyxena* has probably faced local extinctions (Székely 2005; Goia pers. comm.). Therefore, the status of protected species should not remain only a formality but should be effectively applied in order to preserve at least some of the most vigorous populations known to occur in the country.

***Cupido (Everes) decolorata* (Staudinger, 1886)**

Material. 1♂, **Romania**, Buzău county, Dănciuleşti, 20.v.2007.

While it has been recorded from several localities from the northern parts of the country, usually as rare and local (Rákosy & al. 2003; Dincă pers. obs.), *C. decolorata* is very poorly known from most of the southern regions of Romania, being recorded only from the extreme south of Dobrogea where it seems to be very scarce (Rákosy & Székely 1996). A few females were collected on Istriţa Hill (Buzău county), but their habitus didn't allow for a clear separation between *C. decolorata* and *C. alcetas* (Dincă 2006). In May 2007, we collected a male of this taxon in the Subcarpathian hills of Muntenia, very near to Istriţa Hill. This represents the first certain record from Muntenia.
Although not protected by law, *C. decolorata* is listed in the Red List of Romanian Butterflies (Rákosy 2003) as a vulnerable taxon. This species is probably threatened by various factors generally affecting the places where it occurs: overgrazing, overgrowing of open areas by bushes or trees, land burning. Yet, as is the case in other countries (Beneš et al. 2002), the information available on this species is very scarce, and additional data are needed in order to allow a finer assessment of its conservation status in Romania.

Pseudophilotes bavius egea (Herrich-Schäffer, 1852)

Material. 1♂, **Romania**, Constanţa county, Dumbrăveni forest, 21.v.2007.

On May 21th of 2007, we visited the area of Dumbrăveni forest (Constanţa county, southern Dobrogea). This is a protected area that, although fairly similar to other well known "butterfly hot spots" from southern Dobrogea (Canaraua Fetei, parts of Hagieni forest), has been relatively ignored by lepidopterists. In addition to other localized or protected taxa such as *Apaustis rupicola* (Denis & Schiffermüller, 1775), *Carcharodus orientalis* Reverdin, 1913, *Spialia orbifer* (Hübner, 1823), *Parnassius mnemosyne* (Linnaeus, 1758), *Lycaena dispar rutila* and *L. thersamon* (Esper, 1784), we collected a specimen of *P. bavius egea*.
This taxon was recorded for the first time in southern Dobrogea by Székely (1994) who collected the species at Canaraua Fetei. Two years later Rákosy & Székely (1996)

added another locality for this taxon in southern Dobrogea (Şipote). Therefore, our citation represents the third locality for this taxon in Romania. The populations occurring in southern Dobrogea were considered to belong to ssp. *egea*, previously known only from the Asian part of Turkey (Rákosy & Székely 1996; Jutzeler et al. 1997).
In the Red List of Romanian Rhopalocera (Rákosy 2003), *P. bavius egea* is considered endangered, and it is protected in the country. Although it is possible that it is present at other localities from the same area, it is clearly a very local taxon associated to unaltered steppic areas which in Dobrogea are highly threatened by grazing and agriculture. Further studies are urgently needed in order to improve the knowledge on its distribution in Romania and to allow the identification of the best areas that should be correctly managed in order to assure its survival.

***Polyommatus amandus* (Schneider, 1792)** **Fig. 4**

Material. 1♂, **Romania**, Tulcea county, Babadag forest, 24.v.2007.

On May 24 and 25 2007, we made day and night time lepidopterological collecting in the area of Babadag forest (Tulcea county, northern Dobrogea). Among several species that are considered to be rare and/or considerably local in Romania such as *Pyrgus sidae*, *Spialia orbifer*, *Carcharodus orientalis,* etc., we collected one very fresh specimen of *P. amandus* (Fig. 4).
Taking into consideration the literature data, this is the first record of *P. amandus* in Dobrogea in the last 78 years (Caradja 1929) and the first in Romania after a gap of almost three decades (Bálint 1980; Székely 1996, 2005). The specimen was collected in a forest clearing with shrubs and relatively high (apparently lightly grazed) vegetation. It is interesting that the first record of *P. amandus* from Dobrogea comes from the surroundings of Ciucurova (Mann 1866), an area situated about 20 km west of Babadag. In fact, analyzing the vegetation map of the region, it becomes obvious that the two localities are linked by habitats that are similar to the ones from Babadag.
Polyommatus amandus is one of the least known species in Romania. The overall distribution of this species covers relatively uniformly the country's territory, but usually with large gaps among localities (Fig. 5) and with very few records per site. Interestingly, the species is reported as widespread in several countries bordering Romania such as Ukraine, Republic of Molda-

Fig. 4. *Polyommatus amandus*, Babadag forest (Tulcea county), 24.v.2007. Photo V. Dincă.

Fig. 5. Records of *P. amandus* from Romania. Grey dots = collected before 1900 (Fuss 1850, Mann 1866, Czekelius 1898); Black-and-grey dots = collected between 1900-1980 (Caradja 1929, Popescu-Gorj 1964, König 1975, Nadolschi & Şugăr 1975, Bálint 1980, Rákosy 1988, Burnaz 1993, Stănescu 1995, Székely 1996, Rákosy 2002); Black dot = collected after 1980 (this paper); Question mark = doubtful record (Rebel 1911).

via (Tshikolovets 2003), and Bulgaria (Abadjiev 2001). Moreover, some of the populations previously reported in the literature seem to have gone extinct due to unknown causes (Székely 2005, Goia & Dincă 2008). One of the most suggestive examples is represented by the population from Fânaţele Clujului (Cluj-Napoca, Transylvania), where the species was fairly common more than seven decades ago. The species seems to have totally disappeared from the area, although it was flying inside a protected area that has suffered little antropic impact and still today is very rich in butterflies, sheltering almost 100 species on a few hectares (Goia & Dincă 2008).

In the Red List of Romanian Rhopalocera (Rákosy 2003), *P. amandus* is listed as an endangered species, with populations ranging from data deficient to endangered at a regional scale. Further research is strongly needed in order to clarify its distribution, to assess its habitat preferences, and to find explanations for its rarity and decline. As the species is protected by law in Romania and Babadag forest is a protected area, there is a good justification for directed studies that should aim at studying and safeguarding this probable population.

Lycaena dispar rutila (Werneburg, 1864)

During less than three weeks, we observed this taxon at 13 localities (Appendix 2). *Lycaena dispar rutila* has numerous literature citations from all over the country and it is probably the most widespread butterfly present in the Habitats Directive in Romania. However, large populations surviving in optimal habitats are considerably rare and many of the citations for this taxon refer to rather modest populations occurring in small areas. It may often be found in humid spots such as tiny flooded patches near streams, small humid depressions and ditches. Due to the fragility of many of its current habitats, *L. dispar rutila* is correctly considered as vulnerable in the Red List of Romanian Rhopalocera (Rákosy 2003).

Nymphalis xanthomelas (Esper, 1781)

Material. 1♂, **Romania**, Braşov county, Dumbrava Vadului, 6.vi.2007 (ex. larva).

We found this species in the botanical reserve of Dumbrava Vadului (Braşov county, Transylvania). Another larva was observed pupating in the same place.

This species has a poorly understood distribution in Romania, where it is considered as critically endangered (Rákosy 2003). Although it prefers the same habitats as *N. polychloros*, it seems to be rarer and more local than the former. *Nymphalis xanthomelas* could have often remained unnoticed due to its similarity with *N. polychloros*. Nevertheless, other than local apparent regression (König 1972) or probable population fluctuations (Goia & Dincă 2008), another possible explanation for its rarity could be offered by its occasional migratory behaviour (Tolman & Lewington 1997; Beneš et al. 2002) and by its presence close to the western range limit. Given the precarious state of knowledge regarding this taxon, we would consider it as data deficient rather than critically endangered.

A considerable number of taxa of national or European interest were previously recorded from the botanical reserve of Dumbrava Vadului (IUCN category IV) (Székely & al. 2000): *Lycaena helle* (Denis & Schiffermüller, 1775), *L. dispar rutila*, *Maculinea teleius* (Bergsträsser, 1779), *M. alcon* ([Denis & Schiffermüller], 1775), *Euphydryas aurinia* (Rottemburg, 1775), and *Argynnis laodice* (Pallas, 1771). According to the previously published data (Székely & al. 2000) and to our personal observations, the *L. helle* population in this area is probably the largest known in Romania. For these reasons, we reaffirm the proposal made by Székely & al. (2000) that the reserve of Dumbrava Vadului should extend its status to a botanical and zoological one, which would facilitate the implementation of an effective management plan that would ensure the survival of the protected species mentioned above. The main disturbing factor that could severely affect the butterfly communities in the area is represented by natural vegetation successions leading to habitat closure by shrubs and trees.

***Apatura metis* Freyer, 1829**

Material. 1♂, **Romania**, Dobrogea, Constanţa County, Canaraua Fetei, 22.v.2007.

Although it has been previously recorded form the area of Canaraua Fetei (Rákosy & Székely 1996), the species was considered univoltine in southern Dobrogea, being recorded exclusively between June 25th and July 14th. Although definitive conclusions cannot be drawn based on a single specimen, the collecting date suggests that the species has probably two broods in southern Dobrogea, similarly to the populations along the Danube and in the Danube Delta.

The species is protected and listed as vulnerable at the national scale in the Red List of Romanian Rhopalocera (Rákosy 2003). Although mainly restricted to areas along the Danube, the species should be safe within the Danube Delta Biosphere Reserve. Nevertheless, some of the populations still occurring along the Danube's shores might face extinction due to the various types of human activities related to navigation and the improvement of the banks.

Other taxa

During May 19-June 8 of 2007, we visited 29 Romanian locations and identified 105 butterfly taxa, meaning more than 55% of the country's fauna. Three species, namely *Pyrgus armoricanus* (Oberthür, 1910), *Thymelicus sylvestris* (Poda, 1761) and *Cupido minimus* (Fuessly, 1775) are recorded for the first time from Oltenia. These species are probably fairly widespread and abundant in this region; such a lack of data stands as a proof for the great necessity of Lepidoptera studies in many parts of southern Romania (especially Oltenia). This region, although generally not targeted by autochthonous lepidopterists, may shelter populations of local, rare or endangered species that need to be studied. For *Carcharodus orientalis*, currently known in Romania only from Dobrogea and the Danube Delta (Rákosy & Varga 2001), two new localities are reported from the same region (Babadag and Dumbrăveni forests). Both records are based on male genitalia examination, which is the only reliable method for distinguishing between these two taxa. The exact distributions of *C. orientalis* and *C. floccifera* (Zeller, 1847) in Romania still remain very poorly known due to their external similarity.

Besides the species we paid special attention to in this paper, it is worth mentioning several other taxa recorded on this trip (see appendix 2) that are fairly localized in Romania, and/or are of European interest: *Muschampia cribrellum* (Eversmann, 1841), *Pyrgus sidae*, *Allancastria cerisyi ferdinandi*, *Parnassius mnemosyne*, *Euchloe ausonia*, *Colias chrysotheme* (Esper, 1781), *Maculinea arion* (Linnaeus, 1758), *Plebejus sephirus* Frivaldsky, 1835, *Brenthis ino* (Rottemburg, 1775), *Euphydryas aurinia* (Rottemburg, 1775), and *Kirinia roxelana* (Cramer, 1777). Most of these species can survive only in good quality habitats and stand as proof of the (still) high degree of

preservation of the biodiversity of many areas of Romania. Nevertheless, the future of the Romanian "biodiversity hotspots" is now on the edge as the country joined the European Union and has the possibility to make vital socio-economical choices that might have profound effects on its natural capital. An analysis of such potential effects on Lepidoptera is provided by Schmitt & Rákosy (2007) and for various taxa groups by Cremene et al. (2005) and Baur et al. (2006).

Conclusions

- Butterfly DNA-based identification was used in order to provide precise species identification based on larval stages. This technique proved to be excellent for the taxa studied. The case provides an example of how classical identification methods may be effectively combined with molecular techniques.
- Distributional data is improved for 105 butterfly taxa, given the fact that many regions from Romania are still poorly studied from a lepidopterological point of view and local information regarding many taxa is either obsolete or needs reconfirmation.
- *Polyommatus amandus* is recorded for the first time in Romania in the last 28 years and in Dobrogea after 78 years. The decline suffered by this species in Romania remains without a clear explanation.
- *Zerynthia polyxena* is recorded for the first time from southern Dobrogea. This record also represents the rediscovery of the species in the whole province after 80 years.
- A new locality for *Pseudophilotes bavius egea* in southern Dobrogea is reported. This is the third known locality for this taxon in Romania.
- Three species (*Pyrgus armoricanus, Thymelicus sylvestris, Cupido minimus*) are recorded for the first time from Oltenia and one (*Cupido decolorata*) from Muntenia.
- Based on the collection of one specimen of *Apatura metis* in southern Dobrogea in May, the existence of two broods in this region is considered to be probable.

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Appendices

Appendix 1. Localities visited during May 19 – June 8 of 2007 (the symbols refer to the localities in Fig. 1 and Appendix 2).

Date	Locality	County	Alt. (m)	Symbol
19. v. 2007	Ciolanu	Buzău	255	**A**
20. v. 2007	Dănciuleşti	Buzău	360	**B**
21. v. 2007	Şipote	Constanţa	90	**C**
21. v. 2007	Dumbrăveni forest	Constanţa	80	**D**
22. v. 2007	Canaraua Fetei, Băneasa	Constanţa	15	**E**
23. v. 2007	Canaraua Fetei, Băneasa	Constanţa	15	**E**
24. v. 2007	Enisala	Tulcea	40	**F**
24. v. 2007	Babadag forest	Tulcea	115	**G**
25. v. 2007	Babadag forest	Tulcea	115	**G**
25. v. 2007	Horia	Tulcea	140	**H**
25. v. 2007	Greci (Măcin mountains)	Tulcea	90–200	**I**
26. v. 2007	Breaza (Istriţa hill)	Buzău	340–730	**J**
27. v. 2007	Dumbrava Vadului (Vad)	Braşov	495	**K**
27. v. 2007	Perşani	Braşov	500	**c**
28. v. 2007	Dumbrava Vadului (Vad)	Braşov	495	**K**
28. v. 2007	Racoş	Braşov	460	**L**
29. v. 2007	Iernut	Mureş	355	**M**
30. v. 2007	Suatu	Cluj	380	**N**
01. vi. 2007	Câţcău	Cluj	255	**O**
01. vi. 2007	Cheile Babei	Maramureş	265	**P**
03. vi. 2007	Rohia village	Maramureş	360	**Q**
04. vi. 2007	Spini	Hunedoara	240	**R**
04. vi. 2007	Călan	Hunedoara	230	**a**
05. vi. 2007	Teregova	Caraş-Severin	385	**S**
05. vi. 2007	Pecinişca	Caraş-Severin	220–300	**T**
06. vi. 2007	Pecinişca	Caraş-Severin	220–300	**T**
06. vi. 2007	8 km W of Godeanu	Caraş-Severin	380	**b**
07. vi. 2007	11 km S of Rânca	Gorj	940	**U**
07. vi. 2007	Baia de Fier	Gorj	640	**V**
07. vi. 2007	3 km W of Ciupercenii de Olteţ	Gorj	500	**W**
07. vi. 2007	Bârzeşti (Otăsău river valley)	Vâlcea	515	**X**
08. vi. 2007	Valea Mare	Dâmboviţa	225	**Y**
08. vi. 2007	4 km W of I. L. Caragiale	Dâmboviţa	270	**Z**

Appendix 2. Checklist of the species recorded during May 19th - June 8th 2007 (locality symbols correspond to the ones used in Appendix 1). In a few cases, species-level identification was not possible, either because the material was not collected or because the taxa involved lack reliable diagnostic morphological features. Notes: (1) The collected specimen is a female and is difficult to clearly assign it either to *C. alcetas* or *C. decolorata*; (2) *Maculinea alcon* sensu lato (including *rebeli*), based on several recent studies (e.g. Als et al. 2004); (3) *Melitaea phoebe* sensu lato, because of the difficult imago identification and data deficient Romanian distribution of *Melitaea punica telona* Oberthür, 1876 (Rákosy & Varga 2001); (4) Following Rákosy (1999), who considers that the taxon *H. volgensis delattini* is present in all Dobrogea, including Măcin Mountains.

Taxon/Locality symbols	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**	**a**	**b**	**c**
Hesperiidae																													
Erynnis tages							x			x	x	x																	
Carcharodus alceae			x	x	x																								
Carcharodus floccifera											x																		
Carcharodus orientalis				x			x		x																				
Spialia orbifer				x			x																						
Muschampia cribrellum														x															
Pyrgus carthami													x	x															
Pyrgs sidae			x		x		x							x															
Pyrgus malvae			x	x	x				x	x	x						x												
Pyrgus armoricanus			x	x	x		x				x	x			x		x						x	x					
Carterocephalus palaemon											x						x		x										
Thymelicus sylvestris																		x					x						
Ochlodes venatus faunus		x		x						x	x	x					x		x						x				
Papilionidae																													
Zerynthia polyxena		x			x					x															x		x		
Allancastria cerisyi ferdinandi					x																								
Parnassius mnemosyne wagneri				x	x			x																					
Iphiclides podalirius										x																			
Papilio machaon											x														x	x			

Appendix 2. Continuation.

Taxon/Locality symbols	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	c
Pieridae																													
Leptidea sinapis	x			x						x										x			x		x				
Leptidea sinapis/reali												x	x		x	x	x							x					
Anthocharis cardamines				x	x					x	x	x												x					
Euchloe ausonia taurica					x																								
Aporia crataegi															x														
Pieris brassicae												x			x					x									
Pieris mannii																				x									
Pieris rapae		x		x	x					x	x	x	x	x					x	x	x		x	x	x				
Pieris napi/balcana	x				x				x	x	x	x	x	x			x	x	x	x		x	x	x	x	x			
Pontia edusa				x	x					x	x	x		x						x				x	x	x			
Colias croceus			x	x	x							x							x	x									
Colias chrysotheme														x															
Colias hyale/alfacariensis			x		x					x		x			x					x									
Gonepteryx rhamni					x						x																		
Lycaenidae																													
Hamearis lucina	x									x																			
Lycaena phlaeas				x	x				x														x	x	x				
Lycaena helle											x																		
Lycaena dispar rutila				x	x					x	x	x				x	x		x	x			x	x		x			x
Lycaena virgaureae																	x		x										
Lycaena tityrus											x	x							x										
Lycaena alciphron											x	x			x		x		x	x				x					
Lycaena thersamon				x	x																								
Callophrys rubi			x							x	x	x		x	x								x						

Appendix 2. Continuation.

Taxon/Locality symbols	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**	**a**	**b**	**c**
Satyrium pruni												x							x										
Satyrium ilicis																										x			
Satyrium acaciae													x	x				x		x		x			x	x			
Cupido minimus																	x		x	x			x						
Cupido (*Everes*) *argiades*																		x		x			x		x				
Cupido (*Everes*) *decolorata*		x										x																	
Cupido (Everes) alcetas / decolorata (1)										x																			
Celastrina argiolus																		x	x				x	x	x	x			
Pseudophilotes schiffermuelleri		x	x	x	x		x			x																			
Pseudophilotes bavius egea				x																									
Scolitantides orion lariana					x																								
Glaucopsyche alexis					x		x			x	x	x	x	x	x	x		x	x										
Maculinea arion														x		x	x												
Maculinea alcon (2)																				x									
Plebejus sephirus														x															
Plebejus argus		x	x	x	x					x	x	x	x	x	x	x	x					x			x				
Plebejus idas/argyrognomon												x	x			x	x												
Aricia agestis			x	x	x	x	x		x			x					x												
Polyommatus (*Cyaniris*) *semiargus*												x					x		x	x									
Polyommatus amandus							x																						
Polyommatus thersites				x		x				x		x	x																
Polyommatus icarus	x		x	x	x		x			x	x	x	x	x	x	x	x	x	x	x	x	x		x		x			
Polyommatus bellargus			x	x			x			x		x		x		x	x					x							

Appendix 2. Continuation.

Taxon/Locality symbols	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	c
Nymphalidae																													
Argynnis paphia																										x			
Argynnis pandora									x																				
Argynnis aglaja																x	x				x								
Argynnis adippe																x			x	x									
Argynnis niobe							x									x													
Issoria lathonia				x	x					x	x						x				x	x		x					
Brenthis ino												x																	
Brenthis daphne																			x							x			
Brenthis hecate												x		x	x		x			x									
Boloria (Clossiana) euphrosyne										x	x					x													
Boloria (Clossiana) selene											x	x			x	x	x	x	x				x			x			
Boloria (Clossiana) dia																x		x	x	x		x		x	x	x			
Vanessa atalanta			x		x					x		x							x										
Vanessa cardui				x	x			x						x	x				x		x			x		x			
Aglais urticae												x					x												
Polygonia c-album																		x					x	x					
Araschnia levana																	x	x	x					x					
Nymphalis polychloros																							x						
Nymphalis xanthomelas											x																		
Euphydryas aurinia											x	x																	
Melitaea cinxia			x	x	x		x				x	x			x					x									
Melitaea phoebe (3)		x	x	x	x	x	x				x	x		x	x	x													
Melitaea trivia							x			x						x			x										
Melitaea diamina																	x												

Appendix 2. Continuation.

Taxon/Locality symbols	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	c
Melitaea athalia	x										x	x		x	x	x	x		x	x			x			x			
Melitaea aurelia												x	x	x					x	x									
Limenitis populi																												x	
Neptis rivularis																x													
Apatura metis					x																								
Apatura ilia																			x										
Kirinia roxelana																				x									
Pararge aegeria tircis										x									x	x									
Lasiommata megera				x					x	x										x									
Lasiommata maera			x	x	x			x		x						x				x									
Coenonympha arcania															x	x	x	x	x	x						x			
Coenonympha glycerion			x	x	x		x				x	x	x	x	x	x		x	x	x	x	x	x	x					
Coenonympha pamphilus			x	x	x				x	x	x	x	x	x	x	x	x	x		x	x		x	x	x				
Maniola jurtina					x				x		x	x	x		x	x	x	x	x	x	x	x	x	x	x				
Erebia medusa psodea											x	x																	
Melanargia galathea														x		x		x		x					x				
Hipparchia semele														x															
Hipparchia volgensis delattini (4)									x																				

Günter Ebert (Hrsg.) 2005. Die Schmetterlinge Baden-Würtembergs, Band 10: Ergänzungsband. – Eugen Ulmer KG, Stuttgart. – 426 pp., 83 colour photos, 46 black & white photos, 7 maps, 6 graphs. – Hardcover, ISBN 3-8001-4383-6. 49.90 €. (in German).

The series „Die Schmetterlinge Baden-Würtembergs", started in 1991, has been completed. The 10th volume of this remarkable edition is devoted to final information and addition to all previous volumes. It is an explanation for unusual book format, consisting from some separate parts each one is a proper small investigation. List of corrections (also for print mistakes) and additions to previous parts with new data on hostplants, hibernation strategy, new species records, phenology, myrmecophily etc. are given. *Eupithecia conterminata* (Geometridae) is newly found in Baden-Würtemberg since 1957; new observations on *Parnassius mnemosyne* in Schwäbischen Alb are summarized and the distribution of *Leptidea reali* which is recently separated from phenotypically similar *L. sinapis* is discussed. Further additional information is given for *Limenitis populi*, *Fabriciana niobe*, *Brenthis daphne*, *Pyrgus* ssp., *Eilema lutarella*, *Spiris striata*, *Dysgonia algyra* and *Nycteola degenerana*. *Typhonia beatricis* Hättenschwiller, 2000 (Psychidae), and *Platypterigea kadenii* (Noctuidae) are listed as new for the Baden-Würtemberg as well *Platypterigea ingrata* (Staudinger, 1897) as new for Germany. A list of moths' German names is corrected and added for some species from different families and recently published references are summarized here. Special attention is devoted to threatened species of Baden-Würtemberg and a new Red List of Lepidoptera is provided for Baden-Würtemberg. Special part of the book deals with a history of lepidopterological and faunistical investigations in Baden-Württemberg. The part is separated chronologically and richly illustrated with photos and citations from diaries of investigators and old manuscripts. The text part of the book finishes with a voluminous table of habitats continuing the same table already started for Rhopalocera and Heterocera (1 volume) and supplied with a long list (almost 90 pages) of host-plants known for the Lepidoptera from the region under consideration. The book is finished with small entomologic-ecological glossary, an index for species and terms used in volume 10, and an complete index for species and genera treated in volumes 1 to 10. As other parts of the series, the book is finely illustrated with 83 colour and 46 black-and-white fotos, 7 distributional maps and 6 graphics, and published on high polygraphic level. The book will surely excellently blend with the row of the previous issues of "Die Schmetterlinge Baden-Würtembergs". It can be recommended also for all persons interested in ecology and in history of zoological investigations and should be a good example of issue finely embodiment of interweaving between scientific and popular knowledge in studying of our environment. It is really a pity that continuation of the series dealing with Microlepidoptera of the region is not planned. Books of such a standard shall be written and published more frequently.

Vadim V. Zolotuhin

Contribution to the knowledge of the genus *Zygaena* Fabricius, 1775 in Iran (Zygaenidae). Part VIII: Bionomics of high-mountain species in the Alborz Mountains and adjacent areas (introduction; *Z. speciosa*, *Z. cacuminum*)

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Abstract. This is the first of three articles on the burnet moths (*Zygaena* Fabricius, 1775) of the oreal biome in northern Iran. The species of the northern mountain ranges inhabit biotopes in the cushion zone around and above the tree line between 2,650 m and 4,000 m above sea level. Four species are endemic to the Alborz (*Zygaena speciosa* Reiss, 1937, *Z. cacuminum* Christoph, 1877, *Z. ecki* Christoph, 1882) and adjacent areas in Azerbaijan (*Z. christa* Reiss & Schulte, 1967). Populations of a more widely distributed species – *Zygaena carniolica* (Scopoli, 1763) – also occur in the same vertical zone. However, these populations are separated from those of lower regions by a gap of nearly 500 m. Moreover, they possess very characteristic phenotypic and biological adaptations and are well distinguishable. For the first time, *Zygaena speciosa* is recorded from regions outside of the Alam-Kuh area (type locality), i.e. in four localities located in the provinces of Gilan, Mazandaran and Tehran. Data on the bionomics of *Z. speciosa* are provided for the first time; all preimaginal stages are figured. In 2005, 2006 and 2007, cocoons and half and fully grown larvae were found at Kuh-e Tochal (north of Tehran) at an altitude of 3,400–3,700 m. The larvae feed on *Semenovia tragioides* (Boiss.) Manden, a white-flowered Apiaceae. The results of an ab ovo culture (2005–2007) are presented. In 2006, two new and well-distinguished populations were found on Kuh-e Samamus (near Ramsar) and on a pass named Gardeneh-ye Tondrokosch (Tonekabon S). Moths and larvae of the more eastern populations are significantly different from those occurring further west. Larvae at Kuh-e Samamus feed on three distinct Apiaceae (*Trachydium eriocarpum* Born. & Gauba, *T. depressum* (Bois.) Bois. and a further, undetermined species that probably belongs either to the genus *Peucedanum* or to *Semenovia*). Smaller larvae that were collected in the wild (on Kuh-e Tochal and on Kuh-e Samamus) and all larvae from this ab ovo culture over-wintered for a second time. Presumably this is not an artefact but a general strategy of this high-mountain species. Hitherto, the closely related *Zygaena cacuminum* was known only from its type locality, but in 2005 it was discovered at two sites on Kuh-e Shahvar, around 25 km as the crow flies from the Kuh-e Gawkoshan in the Shahkuh range.

Zusammenfassung. Beitrag zur Kenntnis des Genus *Zygaena* Fabricius, 1775 im Iran (Lepidoptera: Zygaenidae). Part VIII: Bionomie der Hochgebirgsarten des Elbursgebirges und anschließender Regionen (Einführung; *Z. speciosa*, *Z. cacuminum*). – Bei der vorliegenden Arbeit handelt sich um den ersten von drei geplanten Artikeln über die Rotzygaenenarten (*Zygaena* Fabricius, 1775) des orealen Lebensraums im Nordiran. Die nördlichen Hochgebirgsarten besiedeln Lebensräume der Dornpolsterstufe im Bereich der oberen Baumgrenze und höher zwischen 2.650 m und 4.000 m Höhe. Vier Hochgebirgsarten sind Endemismen des Elbursgebirges (*Zygaena speciosa* Reiss, 1937, *Z. cacuminum* Christoph, 1877, *Z. ecki* Christoph, 1882) und der anschließenden Regionen Azarbaidjans (*Z. christa* Reiss & Schulte, 1967). Die weiter verbreitete *Zygaena carniolica* (Scopoli, 1763) kommt in der gleichen Höhenstufe vor. Diese Vorkommen sind von *carmiolica*-Populationen tieferer Lagen durch eine Lücke von fast 500 Höhenmetern getrennt. Auffällige habituelle und präimaginalbiologische Unterschiede sind gut entwickelt. *Zygaena speciosa* wird erstmals außerhalb ihrer Typenlokalität im Alam-Kuh-Gebiet gemeldet. Inzwischen konnte die Art an fünf Fundstellen in den Provinzen Gilan, Mazandaran und Teheran nachgewiesen werden. Die Biologie von *Z. speciosa* wird erstmals beschrieben, alle präimaginalbiologischen Stadien werden abgebildet. Raupen und Kokons konnten 2005, 2006 und 2007 nördlich Teheran am Kuh-e Tochal zwischen 3.400 und 3.700 m Höhe gefunden werden. Die Raupen leben hier an der Apiaceae *Semenovia tragioides* (Boiss.) Manden. Die Ergebnisse einer ab-ovo-Zucht (2005–2007) werden vorgestellt. 2006 wurden zwei weitere, wohldifferenzierte Populationen am Kuh-e Samamus bei Ramsar und am Gardaneh-ye Tondrokosch (südlich Tonekabon) gefunden. Falter und Raupen sind von den östlichen Populationen deutlich verschieden. Interssanterweise sind die Raupen der östlichen Vorkommen, deren Falter stark melanistisch sind (Alam-Kuh, Kuh-e Tochal, Dizin-Shemshak) weniger stark verdunkelt, als die Raupen der westlichen Populationen, deren Variabilität im Imaginalphenotyp keine verdunkelten Hinterflügel beinhaltet. Die Raupen am Kuh-e Samamus leben an drei verschiedenen Apiaceae-Arten (*Trachydium eriocarpum* Born. & Gauba, *T. depressum* (Boiss.) Boiss.) und einer weiteren, nicht näher bestimmbaren

Apiaceae (wahrscheinlich *Peucedanum* sp. oder *Semenovia* sp.). Im Freiland gefundene kleine Raupen (sowohl vom Kuh-e Tochal als auch vom Kuh-e Samamus) sowie alle Raupen der ab-ovo-Zucht überwinterten ein zweites Mal. Es wird vermutet, daß dies eine generelle Strategie dieser Hochgebirgsart darstellt. *Zygaena cacuminum*, bislang nur von der Typenlokalität bekannt, wird erstmals vom Kuh-e Shavar, einem Gebirgsstock ca. 25 km Luftlinie vom Shahkuh entfernt, gemeldet.

در ایران (لپیدوپترا: زیگنیده) قسمت هشتم: اطلاعات زیست شناختی گونه های *Zygaena* Fabricius, 1775مقاله ای در مورد *Zygaena cacuminum* Christoph, 1877, *Zygaena speciosa* Reiss,ساکن ارتفاعات البرز و مناطق همجوار (مقدمه: 1937;خلاصه:)"زیگنا" در این مقاله شب پره های *Zygaena* Fabricius, 1775 ساکن بیوم اورئال در ایران مورد بحث قرار گرفته اند، گونه هایی که در بیوتوپهای رشته کوههای شمالی ایران در منطقه ی بوته زار از حدود خط رویش درختان به بالا، بین 2650 و 4000*Zygaena speciosa* متر از سطح دریا زندگی میکنند. چهار گونه از این گونه ها در منطقه ی البرز و آذربایجان آندمیک هستند: در البرز *Z. cacuminum* Christoph, 1877 ،*Z. ecki* Christoph, 1882 در مناطق همجوار و ، *speciosa* Reiss, 1937 ، شب پره ای که در منطقه ی وسیعی *Z. carniolica* (Scopoli, 1763) ،*Z. christa* Reiss & Schulte, 1967 آذربایجان ، انتشار دارد، درهمان محیط و همان ارتفاع از سطح دریا زندگی می کند که آندمیکهای نامبرده نیز می زیند. البته محل این جمعیتهای جداست و نیز از نظر ارتفاع، دیگر جمعیتها در ارتفاع *Z. carniolica* (Scopoli, 1763) ساکن مناطق مرتفع از سایر جمعیتهای کمتری (حد اقل حدود 500 متر پایینتر) هستند. علاوه بر این، خصوصیات فنوتیپی و انطباق بیولوژیکی شان آنها را به وضوح از هم از محلی غیر از تایپ-لوکالیته ی اصلی اش (یعنی علم *Z. speciosa* Reiss, 1937 متمایز می نماید. در این مقاله برای اولین بار کوه) گزارش می شود. در ضمن نمونه های این گونه از پنج نقطه ی دیگر در استانهای گیلان، مازندران و تهران نیز کشف گردید. در برای اولین بار ارائه و تمام مراحل تکاملی این شب پره تشریح *Z. speciosa* Reiss, 1937 اینجا اطلاعات مربوط به بیونومی کامل میگردد. در سالهای 2005، 2006 و 2007 م. پیله، لارو نیمه بالغ و بالغ در کوه توچال در شمال تهران در ارتفاع 3400 الی 3700 با گلهای سفید است تغذیه میکنند. Apiaceae که یک *Semenovia tragioides* (Boiss.), Manden متری پیدا شد. لاروها از گیاه نتایج پرورش آزمایشگاهی این شب پره از مرحله ی تخم (سالهای 2005 الی 2007 م.) در اینجا گزارش می شود. در سال 2006 م. دو جمعیت جدید کاملا" متمایز در کوه سماموس (نزدیک رامسر) و گردنه ی تندروکش (در جنوب تنکابن) پیدا شدند. پروانه و لارو تغذیه می کنند: Apiaceae این جمعیت ها به وضوح از جمعیت های شرقی تر متفاوتند. لاروهای کوه سماموس از سه گونه ی مختلف غیر قابل شناسایی، Apiaceae ، و یک *T. depressum* (Boiss.), Boiss. ،*Trachydium eriocarpum* Born. & Gauba . چه لاروهای کوچکی که در طبیعت (در کوههای توچال و سماموس) پیدا *Semenovia* sp. یا *Peucedanum* sp. احتمالا" گونه ی شدند و چه آنهایی که در آزمایشگاه از مرحله ی تخم پرورش یافته اند، همه دو بار به خواب زمستانی رفتند. به نظر می رسد که این پدیده آرتیفکت نبوده بلکه استراتژی کلی برای این گونه ی ساکن کوهستانهای مرتفع باشد.

Introduction to the series

The series "Contribution to the knowledge of the genus *Zygaena* Fabricius, 1775, in Iran" began in 2000 in *Linneana Belgica*, in which seven parts were published. With the tragic death of its editor, Ronny Leestmans (26.vii.1942–8.xii.2006), the journal ceased to be published. We dedicate the present article to him in memory and recognition of all his support and help during that time.

Fortunately the editorial committee of *Nota lepidopterologica* kindly offered to continue the series in an equivalent presentation. Short summary of the first seven parts will help the reader to get acquainted with the work accomplished so far.

Part 1 (Hofmann 2000a). This is a general chapter presenting the entomological exploration of the fauna of Iran and the development of our knowledge on the indigenous *Zygaena* species. A check-list with distribution based on provinces is provided. The systematic part begins with *Z. seitzi, Z. nocturna*, and *Z. manlia*. New records are provided for Fars, Boyer Ahmad-va-Kohgiluyeh, Markazi, Kuh-e Sorkh, Birjand and the mountains south-west of Kashan. The biology of all three species is described. Based on intensive fieldwork, the nocturnal activity of *Z. nocturna* is confirmed and its relationship to *Z. seitzi* is discussed. A new subspecies of *Z. manlia* (ssp. *piti*) is described from the provinces of Hamadan and Lorestan.

Part 2 (Hofmann 2000b) discusses populations hitherto referred to *Z. rubricollis*. New locality records are given for Yazd, Hamadan, Kerman, and Fars. The biology of *Z. rubricollis kermanensis* – to be transferred in a forthcoming article as a subspecies of *Z. qashqai* – is described. The most melanistic *Zygaena* population is described as *Z. rubricollis ginnereissi*. Today the status of this taxon is under discussion as a valid species (Keil 2003c).

Part 3 (Hofmann 2000c) discusses the distribution and zoogeography of *Z. haematina*. Its biology is also described and figured. With J. Klir as co-author, a new subspecies is named from Lorestan (ssp. *lorestanensis*).

Part 4 (Hofmann (2000d) provides the descriptions of two new subspecies of *Z. haematina* from Darreh Kamaran (ssp. *aurora*) and from the isolated mountain range of Kuhha-ye Quorud (ssp. *fusca*), the latter having been raised to species level by Keil (2003a, 2003d) and Efetov (2004: 40) (without any explanations). The complete biology of *Z. cacuminum* is also described and figured.

Part 5 (Hofmann & Tremewan 2001) deals with the polymorphism of *Z. tamara* and its distribution, for which new records are given for several provinces. Its biology is also described and figured.

Part 6 (Hofmann & Tremewan 2003) raises or reinstates *Zygaena nocturna, Z. aisha*, and *Z. fredi* as well-defined biospecies. The behaviour of the nocturnal *Z. nocturna* is treated and compared with that of *Z. seitzi*, which is strictly diurnal. A new subspecies of *Z. nocturna* is described from the vicinity of Eqlid (Esfahan) and its biology is also described and figured (ssp. *meinekei*). *Zygaena aisha* with predominant nocturnal activity and a very significant larval phenotype is distinguished as a distinct biospecies from *Z. manlia*. From the vicinity of Semirom, *Z. fredi syntopica* and the dichromatic *Z. rubricollis tenhageni* are described. The complete biology of the latter is described and figured.

Part 7 (Hofmann & Tremewan 2005) treats the *Zygaena* fauna of the highest mountain in the Zagros range – the Zarde Kuh. In addition to new distribution records for *Z. seitzi* and *Z. cambysea*, a new biospecies is described from this region (*Z. bakhtiyari*). From the nearby Kamaran valley a unique subspecies of *Z. cambysea* with red, orange, and yellow phenotypes is described (ssp. *kamarana*).

The high-mountain endemics

The *Zygaena* fauna of Iran is characterised by a high percentage of species that occur exclusively in the Alborz or Zagros mountains or in adjacent areas (Tab. 1).
Four *Zygaena* species are endemic to the northern mountain ranges south of the Caspian Sea, between Azerbaijan and the eastern Alborz. While *Zygaena speciosa* Reiss, *Z. cacuminum* Christoph, and *Z. ecki* Christoph, are known only from the Alborz range, *Z. christa* Reiss & Schulte, is restricted to Azerbaijan in the neighbourhood of Dugijan (NE Marand). All four species are restricted to high-mountain areas above

Tab. 1. Altitudinal distribution of the high-mountain *Zygaena* species of Iran. – Northerly and southerly distributed species are listed according to the average of their altitudinal appearance, indicating their ecological and altitudinal main centres. [1] Only personal records are taken into account as in former times the altitudes were often given for too large an area or were often estimated, incorrect or unreliable. [2] Every record is counted here as one date, e.g. when a site was cited as 2,900–3,000 m, the arithmetic mean of 2,950 m is taken into account. In obtaining an *average*, every single mean was counted and divided by the numbers of sites. [3] The new records and a new taxon will be published in a separate publication. [4] The highest record is from the literature (Reiss 1938). [5] There are specimens from a few more localities with reliable data recorded by other collectors; the altitudes mentioned on the labels are within the same zone. [6] Only the very distinct high-mountain populations of this species are taken into account. [7] The second biotope was discovered in 2006 on Sultan Zanjir Dagh (Tabriz NNW).

	species	Number of sites[1]	Lowest and highest record	Average[2]	Vertical span	Endemic to	Latitudinal limitation
Northern mountain ranges	***Z. speciosa***	5[3]	3,270–4,000[4] m	3,484 m	730 m	Alborz	36°50' – 35°52'
	Z. cacuminum	3	2,900–3,720 m	3,328 m	820 m	Alborz	36°37' – 36°32'
	Z. carn. transiens	10[5]	2,650–3,800[6] m	3,307 m	820 m	Alborz	36°50' – 35°44'
	Z. ecki	4[5]	2,650–3,720 m	3,146 m	1.070 m	Alborz	36°37' – 35°55'
	Z. christa	2[7]	3,050–3,150 m	3,100 m	100 m	Azerbaijan	38°35' – 38°32'
Southern mountain ranges	***Z. fusca***	2	2,900–3,200 m	3,025 m	300 m	Kuhhaye Qorud	33°27' – 32°53'
	Z. haematina	24[5]	2,350–3,500 m	2,768 m	1.150 m	Zagros	37°59' – 29°37'
	Z. aisha	3	2,400–3,100 m	2,856 m	700 m	Kerman	29°09' – 29°01'
	Z. bakhtiyari	1	2,800–3,100 m	2,950 m	300 m	Zagros	32°08'

the tree line between 2,600 and 4,000 m altitude. Surprisingly, the same zone is inhabited by very distinctive and relatively uniform populations of *Zygaena carniolica* (Scopoli, 1763), an extremely widespread species that ranges from southern Spain to the Altai mountains, with many populations in the Mediterranean region representing extraordinary subspecies. Several subspecies are described from northern Iran, all of them belonging to the same ecotype that is found only in the cushion zone above and around the tree line. This ecotype of *Z. carniolica* (with a white spot 6, reduced or lost abdominal cingulum, darkened larval phenotype and dark pupal exuviae) is found in several localities where it is syntopic with *Z. ecki*. It is distributed from the Kuh-e Samamus region south of Ramsar to the Kendevan and Demavand region and extends further east to the Shah-Kuh mountain range. The other three species were hitherto known only from their type-localities although a second subspecies of *Z. speciosa* was described. However, this nominal taxon is derived from a population occurring in the same valley just about 2–3 km further south and higher up than the nominotypical form.

Further south in Iran, in the more eremic Zagros, in the Kuhha-ye Quorud and in the higher areas of the Kerman region, a few more species have predominantly settled in this altitudinal zone (Tab. 1): *Zygaena haematina* Kollar (and *Z. fusca* Hofmann), *Z. aisha* Naumann & Naumann, and *Z. bakhtiyari* Hofmann & Tremewan. While the species from the Alborz and adjacent areas (*Z. speciosa, Z. cacuminum, Z. ecki, Z. christa* and *Z. carniolica transiens* Staudinger) are easily recognised as oreal faunal elements, the categorisation of the other four species remains unsatisfactory. They are probably xeromontane species although their ecological niches are not easily recognisable. Their lower occurrence is contrary to expectations, as they inhabit more southerly regions. This may be due to lack of investigations but could also be a feature of this ecological group because in the eremic regions the rainfall decreases at higher altitudes and that makes the biotopes suboptimal from a certain level upward. However, it must be emphasised that in the Zagros range and in the province of Kerman the regions between 3,300 and 4.000 m altitude are poor and only very locally explored (Hofmann 2000a).

While biological data and colour plates (Tab. 2) of all preimaginal stages are available for *Z. haematina* (Hofmann 2000c, 2000d), *Z. cacuminum* (Hofmann 2000d), *Z. aisha* (Hofmann & Tremewan 2003), and *Z. carniolica transiens* Staudinger (as *demavendi* Holik; Tremewan 1976, 1977), nothing was hitherto known about *Z. speciosa* and only the cocoon of *Z. bakhtiyari* is figured (Hofmann & Tremewan 2005). Data for *Z. ecki* and *Z. fusca* are unpublished and for *Z. christa* they are incomplete (Naumann 1985; Karami et al. 1999b). Regarding Tab. 2, with reference to the aspect of the growth of knowledge, one becomes aware how successful fieldwork has been since 1997 when the "new cooperation" started. This network lead to the foundation of the Association Lepidoptera Iranica (A.L.I.) project (Hofmann & Trusch 2006). During the coming years it should be possible to close the remaining gaps by successfully rearing *Z. christa* or finding the unknown preimaginal stages of *Z. bakhtiyari*.

As expected, the species with the most extensive range – vertically and horizontally – and relatively low distribution has the highest number of accompanying *Zygaena*

Tab. 2. Available biological data on the high-mountain *Zygaena* species of Iran. – Explanation of notes: [1] In 2005 B. Mollet and A. Hofmann found this species east of the type locality at Kuh-e Shahvar kucek and Kuhe Shahvar bozorg. Furthermore, there is an unconfirmed record from "Kuh-e Aladagh, Shogan" (vide J. Mooser). [2] There are specimens from a few more localities with reliable data recorded by other collectors; the altitudes mentioned on the labels are within the same zone. Together with *Z. cacuminum*, this species was also found at Kuh-e Shahvar kucek and Kuh-e Shahvar bozorg. Moreover, there is an unconfirmed record from "Kuh-e Bozqush, Siyah-Chaman" (vide J. Mooser). [3] Hitherto unpublished.

	species	Number of loc. to 1965	Number of loc. 1965-80	Number of loc. 2007	Data available for:				Authors
					Egg	Larva	Cocoon	Ethology	
Northern mountain ranges	***Z. speciosa***	1	1	5	2007	2007	2007	1937, 2007	Reiss 1937a, 1937b, 1938
	Z. cacuminum	1	1	3[1]	2000	2000	2000	2000	Hofmann 2000c
	Z. carn. transiens	4	5	16	1976	1976, 2007	1976, 2007	1976, 2007	Tremewan 1976, 1977
	Z. ecki	2	3	5[2]	2007	2007	2007	1977	Tremewan 1977
	Z. christa	0	1	2[3]	1985, 2007	1985, 2007	–	1985, 2007	Naumann 1985
Southern mountain ranges	***Z. fusca***	0	0	2	2007	2007	2007	2000, 2007	Hofmann 2000d, Keil 2003d
	Z. bakhtiyari	0	0	1	–	–	2005	2005	Hofmann & Tremewan 2005
	Z. aisha	0	1	3	2003	2003	2003	2003	Hofmann & Tremewan 2003
	Z. haematina	2	3	24	2000	2000	2000	2000	Hofmann 2000c, 2000d

Tab. 3. The high-mountain *Zygaena* species of Iran (vertically listed) and their syntopy (●), with accompanying oreal, arboreal and eremic species (horizontally listed) in the Alborz (A), the Zagros (Z) and/or in the mountains of the areas around Kerman (K). Only in the Alborz is there more than one high-mountain species at one site. While *Z. speciosa* and *Z. cacuminum* are syntopic only with other oreal species, *Z. carniolica transiens* and *Z. ecki* occur with species of a lower vertical distribution, viz. *Z. cambysea, Z. haberhaueri* and *Z. rosinae*. In the Zagros range and in Kerman, no syntopy of high-mountain species with other high-mountain species is observed. Here they are predominantly syntopic with species of the eremic biome.

		Oreal species of Alborz and adjacent areas					High-mountain species of Zagros and Kerman				Syntopic non-high-mountain species of Alborz (A), Zagros (Z), Kerman (K)											
		speciosa Reiss, 1937	*cacuminum* Christoph, 1877	*carniolica* Scopoli, 1763	*ecki* Christoph, 1882	*christa* Reiss & Schulte, 1967	*fusca* Hofmann 2000	*bakhtiyari* Hofmann & Tremewan, 2005	*aisha* Naumann & Naumann, 1980	*haematina* Kollar, 1849	*haberhaueri* Lederer, 1870	*rosinae* Korb, 1903	*cambysea* Lederer, 1870	*tamara* Christoph, 1889	*seitzi* Reiss, 1938	*nocturna* Ebert, 1974	*escalerai* Poujade, 1900	*manlia* Lederer, 1870	*fredi* Reiss, 1938	*chirazica* Reiss, 1938	*sengana* Holik & Sheljuzhko, 1956	*ginnereissi* Hofmann, 2000
		A	AZ	AZ	AZ	Z	Z	Z	Z	ZK	ZK	K	K									
Oreal species of Alborz and adjacent areas	***Z. speciosa***	–		●																		
	Z. cacuminum		–	●	●																	
	Z. carn. transiens	●	●	–	●						●	●	●									
	Z. ecki		●	●	–						●	●	●									
	Z. christa					–					?			?								
High-mountain species of Zagros and Kerman	***Z. fusca***						–											?		?		
	Z. haematina							–				●	●	●	●	●	●	●	●	●		
	Z. aisha								–										●	●	●	●
	Z. bakhtiyari									–			●		●				●	●		

species. *Zygaena haematina* is recorded from 24 localities situated between Hakkari (Turkey) and Dasht-e Arjan (Iran, Fars) and within this range it is syntopic with nine species. *Zygaena aisha* inhabits biotopes together with *Z. ?rubricollis ginnereissi, Z. chirazica* and *Z. sengana* while *Z. haematina* and *Z. bakhtiyari* are syntopic with several arboreal species, e.g. *Z. chirazica, Z. fredi, Z. tamara, Z. cambysea, Z. manlia, Z. nocturna*. No syntopy is observed for *Z. fusca* and *Z. christa*. Syntopy with other oreal *Zygaena* species can only be confirmed for the Alborz species. *Zygaena cacuminum* is accompanied on Shah-Kuh and Kuh-e Shahvar by *Z. ecki* and *Z. carniolica*. *Zygaena speciosa* is found in all its localities flying together with *Z. carniolica* (Tab. 3) .

In the present paper and two others, forthcoming, new data on the biology and distribution of these high-mountain species will be presented, beginning here with *Zygaena speciosa* and *Z. cacuminum*.

Abbreviations

CAHO	Collection Axel Hofmann, Breisach-Hochstetten, Germany.
CCMN	Collection Clas M. Naumann, now in ZFMK, Bonn.
CFDM	Collection Franz Daniel, München (Munich), now in CMWM.
CMWM	Museum Thomas J. Witt, München, Germany, assigned to Zoologische Staatssammlung München.
ZFMK	Zoologisches Forschungsmuseum A. Koenig, Bonn, Germany.

Zygaena speciosa Reiss, 1937

"*Zygaena* (*Peristygia*) *speciosa* n. spec." Reiss, 1937a: 466, figs a2, b2, c2. Type locality: "Persia s., Elburs mts. s., Tacht i Suleiman, Hecarčal-Tal, 28–3200 m" (acc. label of "Type ♂"). (see distribution map, loc. no. 3).

„*Zyg.* (*Peristygia*) *speciosa* Reiß var. *suleimanicola* n. var." Reiss 1938: 165. Type locality: "Persia sept., Elburs mts. c. s., Tacht i Suleiman, Särdab Tal (Hećerčam), 4200 m" (acc. label of "Type ♂"). (see distribution map, loc. no. 4).

The original description of *Z. speciosa* was based on 16♂, 6♀ collected by E. Pfeiffer on "3–7.VII.36". The "Type ♂" and "Type ♀" are figured in monochrome and recorded as being deposited in coll. F. Daniel/München. Both specimens together with the paratypes (also from coll. Reiss) are now in coll. T. Witt/München. Single paratypes are in coll. C. M. Naumann (now Zoologisches Forschungsmuseum Bonn) and coll A. Hofmann.

The original description of *Z. speciosa* var. *suleimanicola* was based on 125♂, 42♀ collected by E. Pfeiffer & W. Forster on "20.VII.37". Type series in coll. T. Witt/ München via coll. F. Daniel/München. Paratypes in several collections (coll. C. M. Naumann, now Zoologisches Forschungsmuseum Bonn, coll. A. Hofmann etc.). Synonymised by Hofmann & Tremewan (1996).
Reiss (1937a, 1938) has provided detailed descriptions of the moths of both taxa; they were collected in a north-facing valley called *Sardab* (cold water) valley, south-east of

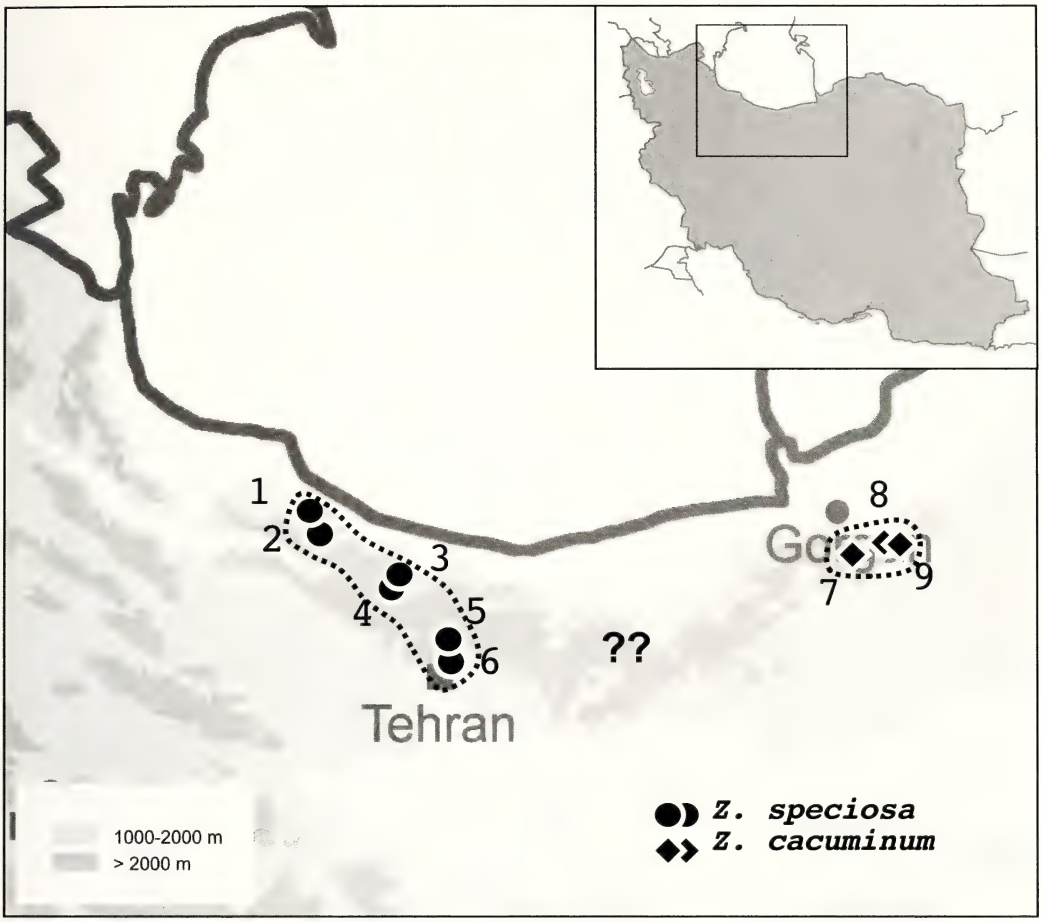
the highest point in this area, the Alam Kuh (4,850 m). The type localities are about three kilometres from each other as the crow flies. While the nominotypical form is found at 3,000 m altitude, just after passing *Tange Golu* (narrow gorges), var. *suleimanicola* was discovered above the high valley of Hezarchal, from where a pass (Hezercham) leads to the southern side. In between these two localities (3,700 m), Clas Naumann and Gerry Tremewan collected a total of four specimens on 28.vii.1997 in the high valley of Hezarchal (Figs 4–5) thus documenting that gene flow occurs between the populations. All specimens from this area are melanistic with darkened hindwings and reduced spots on the forewings. They are purely five spotted without any trace of a spot 6. While nearly 50% of the moths from higher up (4,200 m) have spot 4 reduced or even lost, the phenotypes from below 1,000 m show slightly more pronounced forewing spots. Apart from that, no significant differences are found, which is why Hofmann & Tremewan (1996) and Karami et al. (1999a) placed *suleimanicola* Reiss, in synonymy with *Z. speciosa*.

The discovery of the preimaginal stages of *Zygaena speciosa* at Kuh-e Tochal

Until 2005, nothing was known about the preimaginal biology of this species. Reiss (1937a) refers to E. Pfeiffer who speculated one of the several *Astragalus* spp. present to be the larval host-plant. The following year, E. Pfeiffer and W. Forster observed moths being attracted to a *Thymus* sp.; nectaring moths and copulae were seen on this plant and these collectors considered this to be the host-plant. From then on, this information was cited in the literature (Holik 1938; Hofmann & Tremewan 1996; Karami et al. 1999a). The last authors mention the observation of a dead larva "in July 1980 at the type locality in the immediate vicinity of an unidentified species of *Thymus* (CMN)". Further efforts in finding the moths or preimaginal stages failed in 1999 and 2000 by C. M. Naumann, and on 16 July 1999 by B. Mollet and A. Hofmann.

In 2005 we were in Iran for a three-month tour. At the beginning of August at the end of our tour we were visited by our Iranian colleague Ahmad Karbalaye who showed us his interesting collection of Zygaenidae from the last few years. This collection included a couple of *Z. speciosa* collected around the last teleski station (3,740 m) on Kuh-e Tochal (3,964 m) close to Tehran, a new locality for *Z. speciosa* and situated on the south side of the Alborz (see distribution map, loc. no. 6). This valuable information – thanks to Ahmad Karbalaye – motivated us to search for the proverbial needle in the haystack. Without any idea of the exact biotope, we first searched for meadows containing thyme plants around the station between 3,700 and 3,800 m altitude. However, field experiences with the closely related *Z. cacuminum* some years before (Hofmann 2000d) reminded us to be critical with such unconfirmed speculations. Like *Z. cacuminum*, *Z. speciosa* belongs to a species-group that lives exclusively on *Eryngium* spp. or on other Apiaceae. But no *Eryngium* or any other Apiaceae were found. On the top of the mountain and near the station there were still small snow-fields at the beginning of August, a strong wind was blowing and when the sun was hidden behind clouds it immediately became cool. Only

a few high-mountain butterflies were observed, *Melitaea saxatilis* (Christoph), *Colias sagartia* Lederer, *Polyommatus* (*Agrodiaetus*) *posthumus* (Christoph). In the afternoon one hour before the last telecabin left to go down to the ground station at 1,800 m, on the other side of a scree of rock debris and moving stones, an interesting south-west-facing biotope (Fig. 10) east of the telecabin station was discovered with plenty of *Onobrychis cornuta* cushions, several Gramineae spp., a *Thymus* sp. smelling of mint, and pinkish-flowering thistles. As the whole area, including this site, was overgrazed, but not too strongly because of its steepness and the poor vegetation, the shepherds and their sheep never remained here very long. However, as some *Z. carniolica* were flying, we stayed here longer. Suddenly a black moth in clumsy flight was observed just a few metres away from the orbit of the net. For a moment we were unable to chase it because of the strong winds, but of course, we would not be telling this story if the moth had not found its way into the net – a large perfect female of *Z. speciosa*. It was the only one, but it did not need too much self-discipline to keep it alive for laying eggs, although it was so fresh that it was unclear whether it had already mated. In spite of our scepticism we put it into a small plastic box. And then, while making a small temporary camp, whitish-flowering Apiaceae, similar to *Trachydium eriocarpum* (the host-plant of *Z. cacuminum*), were found among the stones (Figs 11–14). Now we knew that we were at the very exact locality and immediately started to turn over stones expecting to find cocoons or larvae. After more than one hour of work on unstable slopes without any further success, we had to leave the biotope hoping to get the last telecabin coming down. It was already very late and the prospect of walking back 15 km or more and 2,000 m down in cool winds made us hurry. Just at this moment – with all the luggage hanging on her back and arms – Tabassom reported the discovery of a "black larva with yellow spots". No doubt, this must be the fully grown larva of *Z. speciosa*, sitting fully exposed in the late afternoon sun on the west side of a warmed-up big stone close to one of the Apiaceae plants. Forgetting the time we took several photos (Figs 11–14), not forgetting to press some plants for exact determination. The moment we wanted to start we realised that the female was just starting to lay eggs. We couldn't put it in the dark rucksack, as it needed the evening sun. Fortunately, thanks to the telecabin guardian, we were able to find accomodation at a nearby hotel that was exceptionaly open. The next day, before returning to Tehran, we went again to the biotope. Nothing was flying nor were any other larvae found. However, a cocoon was discovered under a stone of medium size (12 × 7 × 5 cm), thus completing the bionomics of *Z. speciosa* with a minimal number of records: one female, one fully grown larva, one cocoon and one batch of eggs together with the pressed unknown host-plant. With the awareness of having had an entomological highlight we left Kuh-e Tochal on August 4, 2005. However, the price we paid was high. It was the very last day in the wild on this tour and our driver, with all the larvae from three months' fieldwork in the car, forgot this day for half an hour his job that he had done so carefully during the long tour. On the Tochal base plateau the car stood exposed in the full mid-day sun and heated up on the inside to more than 70°C. Over 1,400 *Zygaena* larvae – the majority already just before diapause – cooked and died. It needed weeks to revitalise from this shock and two years to write this article.



Map. Records and areals of the two oreal *Zygaena* (*Mesembrynus*) species in northern Iran. While *Z. speciosa* (loc. 1–6) is known from central and western Alborz, the closely related *Z. cacuminum* is only recorded from Shah Kuh (loc. 7) and Kuh-e Shahvar (loc. 8, 9) S of Gorgan. Numbers of localities: **1** Kuh-e Samamus, **2** Gardaneh-ye Tondrokosh, **3** Hezarchal (type locality of *Z. speciosa*), **4** Hezercham (type locality of *Z. speciosa suleimanicola*), **5** Dizin-Shemshak, **6** Tochal. – Distances between the most peripheral populations of *Z. speciosa* are 140 km, those of *Z. cacuminum* are only 30 km. Absence of records between Tehran and Gorgan (270 km) is assumed to be an artefact due to lack of fieldwork. The mountains in this region are not so high, but east of Demavend (vicinity of Lac Taar) and north-east of Semnan they reach altitudes above 3,500 m.

Zygaena speciosa at Dizin-Shemshak (province Tehran), 3,500–3,800 m (Figs 7–8)

In the vicinity of the pass between Dizin and Shemshak, A. Karbalaye had already collected, in 2001, some burnet moths including *Z. carniolica* and a couple of *Z. speciosa* (labelled: "M. Dezen, 3.800 m, 5.8.2001"; (see distribution map, loc. no. 5). The following year but more than one month earlier, W. ten Hagen found a single female here at the top of the teleski station ("Tehran N, Elburs, NE Dizin, 3550 m, 2.7.2002"). Until these discoveries, *Z. speciosa* was known only from its type locality.

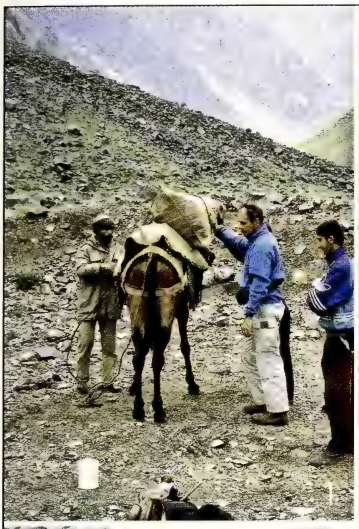
The phenotype of this population differs slightly from the nominotypical form and is more similar to moths from Kuh-e Tochal, as one would expect. While all moths from the area around Dizin are also melanistic, but with the hindwings slightly more red scaled and the forewings tending to being six spotted, the population from Kuh-e Tochal is phenotypically between the darkened 5-spotted populations of Alam-Kuh (100 % five-spotted) and that from Dizin-Shemshak (here two moths are six spotted, the other two have spot 6 vestigial).

We visited this locality at the end of July 2003 and 2005 without any success. However, with the newly acquired information about the larval host-plant (from Kuh-e Tochal), a westerly facing site where the same Apiaceae occurred (as with the biotopes at Kuh-e Tochal) was visited on July 10, 2006 on the south side of this ridge (3,500–3,600 m). The flight period was already coming to an end, as only one female, two vacated cocoons (under stones) and one batch of eggs (under a stone, Fig. 8) were found on this date. One week later, 1♀ and 1 worn ♂ were observed at the same locality. The male was attracted to a virgin female of *Z. speciosa* from Kuh-e Tochal (e. p.).

Zygaena speciosa at Kuh-e Samamus (province Gilan), 3,350–3,600 m (Figs 26–31, 34–45)

This new locality from 3,350 m up to the summit (3,620 m) of Kuh-e Samamus (Tonekabon SW) on June 25, 2006 (see distribution map, loc. no. 1) was discovered by Alireza Naderi (Karaj). The description of this well-separated and easily distinguishable new subspecies will follow in another paper. Five days later, A. Hofmann and A. Naderi visited the biotope at 3,400 m altitude. In spite of very bad weather conditions (fog, rain, subsequently a cold wind, temperature falling to 8°C), the preimaginal stages and four moths (sitting inactive on stones) were found. In addition to more than a dozen cocoons that were already vacated (some with the pupal exuviae still protruding), nine with living pupae inside were found and taken with us. All were hidden, spun under predominantly flat stones of a size somewhat bigger than those from Kuh-e Tochal. Only three cocoons were spun under stones of medium size that could be taken with us. Moreover, we found seven larvae (one fully grown, six fairly small, 10 and 12 mm) hidden under stones or just coming out to warm up when the sun came through for a short moment. A third visit (July 6, 2006, A. Hofmann & T. Kia Hofmann) had to be cancelled as the weather was extremely bad. Further successful

Figs 1–6. Iran, Alborz, Alam-Kuh region, type locality of *Zygaena speciosa*. **1.** Many trials to rediscover the species failed because the weather conditions can be "very suboptimal" even in July and August; Bernard Mollet putting our luggage on a mule near Tange Golu, 15.vii.1999. **2.** On the way to the Hecarchal valley, 15.vii.1999. **3.** Our camp site near the narrow gorges (Tange Golu); here we had three days rain, wind and storm. **4.** Fresh snowfall in the Hecarchal valley at the site where we expected to find the biotopes, 16. vii. 1999. **5.** A good locality with plenty of host-plants was discovered in 2006. Although it was sunny and mild at the beginning of August, not a single specimen could be found (Note. Fig. 4 shows the same site just 3 weeks earlier). **6.** Clas Naumann and Gerry Tremewan had more luck when they visited Alam Kuh in 1997; four fresh specimens were found on 28.vii.1997 (Fig. 6, photo by C. M. Naumann.).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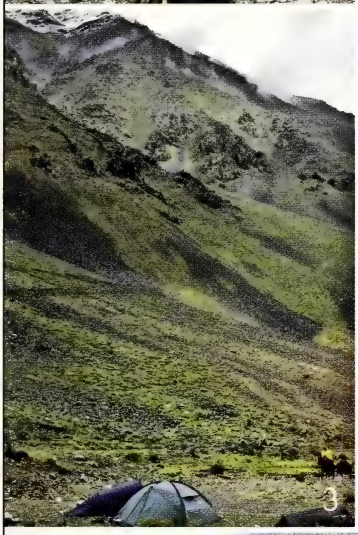
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observations and collections were possible on the fourth visit (July 15, 2006, A. Hofmann) when *Zygaena speciosa* was common on this date and accompanied by masses of *Z. carniolica*.

Zygaena speciosa at Gardaneh-ye Tondrokosh (Zarout) (province Mazandaran) 3,270–3,350 m

While crossing the Alborz range (14.vii.2006) on a bad trail between Qazvin and the Caspian Sea, we stopped at the highest pass named Gardaneh-ye Tondrokosh (ca 3,250 m) and climbed to the nearby summit of the mountain. Here another population of *Z. speciosa* (see distribution map, loc. no. 2) was found syntopic with *Z. carniolica*. This population inhabits a west- to north-west-facing biotope and in good weather one can see the Kuh-e Samamus that is around 20 km distance as the crow flies. Like the population from the latter locality, it is not melanistic on the hindwings, as in the eastern populations from the type locality, from Dizin-Shemshak and from Kuh-e Tochal. Therefore it will be referred to the new subspecies from Kuh-e Samamus in a forthcoming paper. A white-flowering, undetermined Apiaceae, probably a *Semenovia* sp., grows in the biotope and must be the host-plant as no other Apiaceae was present. While *Z. carniolica* was visiting the flowers of an *Acantholimon* sp. and *Thymus* sp. in the late afternoon, all moths of *Z. speciosa* were observed flying very quickly and therefore they were difficult to collect.

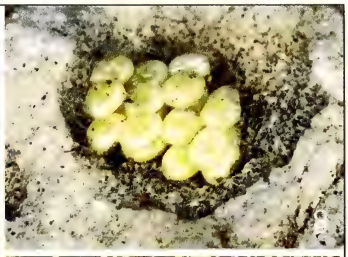
Description of an ab ovo culture (2005–2007) and the preimaginal stages (Kuh-e Tochal)

(Figs 15–25, 32–33)

The above-mentioned female from Kuh-e Tochal laid 70 eggs that were deposited in three batches, all on the same day (August 3, 2005). As it was disturbed several times by moving and walking, the eggs were not deposited in regular batches.

Ovum. The eggs are relatively large, bigger than that of *Z. tamara* (reared at the same time). Usual whitish cream colour tinged with orange-brown. Yolk sack bigger than in *Z. tamara*.

Figs 7–13. Iran, Alborz, new records of *Z. speciosa* from Dizin-Shemshak and Tochal. **7–8.** Between Dizin and Shemshak. In spite of the fact that *Semenovia tragioides* – one of the larval host plants – is not very common on this extremely steep biotope, one batch of eggs was found on the underside of a stone, 10.vii.2006. **9–13.** Kuh-e Tochal, province Tehran, observations in the wild. **9.** Before starting to feed, the larvae first come out and warm up on warmed stones or expose themselves to the sun, 28.vi.2006. **10.** Typical *Z. speciosa* biotope in the boulder scree zone close to snowfields at 3,650 m altitude, with flowering *Onobrychis cornuta* bushes at the end of the larval phase, 28.vi.2006. **11.** At the end of June the host-plant sets its first seeds. When it is sunny the half- or fully-grown larvae crawl out from under the stones and preferably eat the last fresh buds (note larva sitting on right stem), 28.vi.2006. **12–13.** About one-third of the adult larvae that we found in the field were parasitised by Chalcididae or Tachinidae, Kuh-e Tochal, 3.viii.2005.



Eggs were deposited in two or three layers. In the heat of Tehran the embryos developed very quickly and emerged after six days (August 9, 2005). Before emergence, the eggs changed in colour and became greyish (darker than in *Z. tamara*). In 2006, one batch of eggs was found in the wild at a site near Dizin – Shemshak (Tehran). It was deposited in two layers on the underside of a stone (similar behaviour to that of *Z. cacuminum*), the batch being of medium size and placed directly beneath the host-plant. It consisted of 19 (11+8) eggs (Fig. 8).

From the F1 generation (derived from the female from Tochal) two subsequent cultures (F2) were reared in 2007 when successful pairings were obtained (May 21 and 27, 2007).

In CV070521,1 (= first "Copula-Versuch" [copulation trial] on May 21, 2007) the copula (Fig. 15) took place at 14h00 and remained till 13h00 of the next day. The same afternoon the female laid five batches of eggs, deposited in two to three layers, some slightly irregular.

In CV070527,3 (= third "Copula-Versuch" on May 27, 2007) the copulating pair was found at 16h00 and had already separated by the next morning at about 10h00. However, the same day the female laid three batches of eggs within three hours. The first batch (slightly irregular) consisted of 43 eggs. The second was deposited in three layers and comprised 29 eggs (15+12+3), the third in a double layer (Fig. 16) consisted of 33 eggs (22+11).

All in all, six batches of eggs were laid in captivity on the underside of the wooden construction of the box, the female sitting with the dorsum downwards. Only one batch was laid on the underside of a leaf of *Eryngium planum* (L.) (Apiaceae).

While in Iran, the egg phase lasted only 6 days, but the cultures in Germany needed 8 to 9 days. This is one day shorter than *Z. tamara* or *Z. nocturna* under the same conditions. In all cases, all batches were fertile. Infertility or partial infertility (of single eggs) was not observed.

Larva. On the day of hatching, the L1 larvae ate parts of their egg shells and then sat close together before starting, after 24 hours, to accept the several Apiaceae plants that they were offered, e.g. *Seseli libanotis* (L.) Koch, *Eryngium planum* Linnaeus, and *Pastinaca sativa* Linnaeus. The freshly emerged L1 larva is already pigmented and

Figs 14–27. Preimaginal stages of *Z. speciosa* from Kuh-e Tochal and Kuh-e Samamus. **14.** The white-flowering larval host-plant, *S. tragioides*, mostly grows between unstable stones, Kuh-e Tochal, province Tehran, 28.vi.2006. **15–25.** Breeding *Z. speciosa* in captivity (2005–2007). **15–16.** After two years the first moths (F1) emerged in spring 2007. A successful copula was obtained on 21 May 2007; the next day the ♀ laid three batches of eggs (F2) arranged in 2 and 3 layers. **17–18.** Already the pre-diapause larvae – here in the L3 – have the typical aposematic pattern; however, the black coloration is slightly less developed, 31.viii.2005. **19–20.** Diapausing larvae (L4D), 14.ii.2006. **21.** Half-grown larva in the postdiapause instar (L5). **22.** Cocoon with pupal exuviae, e.o., Kuh-e Tochal. **23–24.** The yellow spots of the fully grown larvae (here from the ab ovo culture of 2005) are bright and obviously contrasting, thus giving the larvae a strong aposematic pattern, 7.v.2007. **25.** Lateral pattern of the fully grown larvae; well visible are the areas of ground colour on the verrucae, 30.vi.2006. **26–27.** All cocoons were spun on the underside of stones; some places had such excellent microclimatic conditions that even 2 cocoons were spun close to each other, Kuh-e Samamus, 30.vi.2006.

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looks greyish. Two pronounced brown lines (one on each side of the lighter greyish white dorsum) are visible; the ground colour is also dominated laterally by brownish darkened pigmentation interrupted by the lighter verrucae. Ventrally the ground colour is whitish grey; the crochets of the abdominal prolegs are dark brown to black. White setae long, dark setae short. At the end of L1 (after 7–9 days in Iran), the typical pattern of the fully grown larva is already visible. However, the coloration is not so strong and black as in the postdiapause stages – it is more dirty brownish in L1. This means that the larva of *Z. speciosa* is darkened from the beginning onwards, whereas typical eremic or arboreal *Zygaena* species in Iran have a green or creamy-white coloration before diapause and obviously change their pattern successively after diapause. This observation fits well with those of other oreal species, e.g. *Z. cacuminum*, a characteristic that must be interpreted as an adaptation to high-mountain climates. Even in August, when the young larvae hatch, the temperatures at night can fall close to 0°C and bad weather conditions with rain and storms can last for days. In the L2 stage the pigment coloration changes more from brownish to black and becomes extended dorsally so that the lighter grey ground colour remains only as a narrow dorsal line. 10 yellow-white dorso-subdorsal spots (DSS) are now present from the 2nd thoracic to the 8th abdominal segment. The larvae now preferred *Pastinaca sativa,* less so *Seseli libanotis* and only a few feeding marks were noted on *Eryngium planum* or *E. giganteum.* In captivity the larvae fed well and grew quickly. The L3 larva (5 mm, Figs 17–18) exhibits nearly the same pattern as that found in the fully grown larvae; only the spots become more accentuated and the yellow DSS are more brilliant. The majority of larvae had already entered diapause by the end of June; single individuals underwent a further moult (L4) and went on feeding till the end of August. After the first year, i.e. in the autumn, 51 larvae had entered diapause (L4D, L5D, Figs 19, 20) when the contrasting coloration was reduced; the ground colour became light brownish while the black pigmentation was medium brown and the yellow dorso-subdorsal spots were weaker. The loss of larvae was low and only a few died during diapause. The following spring (end of March), the larvae (4 mm) were taken into a warm room and subjected to greater humidity. After 10 days the larvae moulted (L5, partly L6). Under the same conditions, larvae of other *Zygaena* species moulted much quicker: *Z. cambysea* (3 days), *Z. manlia* (3), *Z. tamara* (5), *Z. christa* (5). After moulting, the *Z. speciosa* larvae regained their predominant black coloration with the yellow spots less pronounced in the beginning (later becoming more significant). Some larvae died but the majority fed well and grew. However, all larvae fed for just one instar (6–7 mm) and after 4 weeks they all entered diapause for a second time (L6D, partly L7D).

Figs 28–31. Biotopes, host-plants and preimaginal stages of *Zygaena speciosa* from Kuh-e Samamus (SW Ramsar). **28.** In the lower parts of Kuh-e Samamus there are dense forests followed by subalpine meadows from 2,300 m altitude upwards. The prostrate *Juniperus sabina* L. (2,300–2,600 m) is characteristic of the transition zone to the treeless highest regions (2,700–3,620 m). **29.** The trail to the pass (3,350 m) was partly destroyed in 2006 so that one had to walk from 2,650 m upwards. **30.** Freshly emerged ♀ of *Z. speciosa* warming up on a limestone rock, 30.vi.2006. **31.** Flowering plants of a pinkish-flowered *Thymus* sp. were preferably visited for nectaring when the sun was shining, 15.vii.2006.

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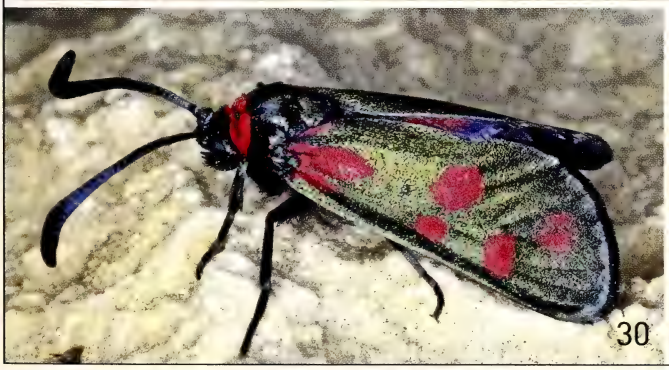
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Quite remarkable was the feeding behaviour of the post-diapause larvae. The main activity was observed during the afternoon. At dusk and during the night the larvae hide themselves under leaves or sit inactive under papers. This observation was confirmed after the following diapause in 2007. Thirty-five larvae were overwintering (2006 to 2007); after moulting at the end of March 2007, many larvae died (probably because of an application of the active substance fipronil ["Frontline"] on the house dog as prevention against ticks). Only a dozen larvae that were taken into the room some weeks later survived and all of these developed well.

After two further moults (L10, partly L11) the first larva became fully grown (Figs 23–25, 32–35) at the beginning of May 2007. The fully grown larva has a light bluish-grey ground colour although this is strongly reduced. The intersegmental regions are only visible when the larva stretches by moving. On the dorsum the ground colour is reduced to a narrow zigzag band by the two expanded black dorsal spots. Posteriorly, the dorsal line is broader on every segment; anteriorly it is very thin (Fig. 23). The large anterior dorsal spot (ADS) is connected to the posterior dorsal spot (PDS) on both sides (dorsally and ventrally) and even the areas surrounding the verrucae or dorsal warts (D1+D2; terminology after Tremewan 1985: 91; Hofmann 2003: 77) are dark-pigmented, only the bases of the setae are lighter. In the same way the subdorsal verrucae (SD) are also ring-shaped surrounded by one large black spot that is formed by the anterior subdorsal spot (ASS) and by the posterior subdorsal spot (PSS). Only the tops of the verrucae are of the ground colour. The immediate surrounding of the spiracle at the lower end of the connected subdorsal spot is also lighter. Further ventrally, the dark pigmentation becomes more brownish-black. The next verruca under the spiracle – the upper lateral verruca (L1) – is in the same way surrounded and even further ventrally the L2 verruca is darkened. Ten large, bright yellow, dorso-subdorsal spots (DSS) of oval shape contrast strongly although the first and the last are reduced. Retractile first thoracic segment, abdominal prolegs and anal prolegs light greenish-yellow. White setae long, predominant on the abdominal segments. Black setae present on the first and second thoracic segment and on the last abdominal segment short, rather stiff.

Cocoon. Half a dozen cocoons were found in the wild on the Kuh-e Tochal on August 4, 2005 (1), 2006 (4) and July 31, 2007 (1). Moreover, remnants of cocoons from former years were noted. Eight cocoons resulted from larvae found on June 28, 2006. From the ab ovo cultures that began in 2005, nine cocoons were spun on the underside

Figs 32–35. Comparison of final instar larvae collected in the wild at Kuh-e Tochal (**32–33**) and Kuh-e Samamus (**34–35**). All larvae from Kuh-e Tochal exhibit a mediodorsal band of ground colour, while the larvae from Kuh-e Samamus are generally darker and especially this band is narrower or even absent. **36–38.** Kuh-e Samamus, biotope and fieldwork. **36.** Optimal weather conditions with full sun on the *Z. speciosa* biotope, while clouds from the Caspian Sea hang lower down in the valleys, 15.vii.2006. **37.** Two weeks earlier we had been here twice under very different conditions, but fog, rain and cold temperatures did not prevent us from searching for larvae and cocoons under stones; Alireza Naderi in "warm" clothes, 30.vi.2006. **38.** 2♂ of *Z. speciosa* crawled out from their hiding places under stones immediately when the sun came out for a few minutes, but sat inactively when it became cloudy again, 30.vi.2006.

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of the lid of the box and under stones between May 4–12, 2007. At Kuh-e Samamus 25 cocoons were found and four resulted from larvae.
The cocons are slightly wrinkled, semi-ovoid, extremely fragile (cannot be removed from stones without destroying its base). Colour variable, from whitish to brownish or golden and with metallic sheen. Weakly developed ribs occasionally visible posteriorly. Pupal exuviae are mid- to dark brown. Exuviae from ab ovo cultures darker than those found in the wild. Cocoon from 2007, found at 3,400 m, differing in browner, more golden coloration and in lighter brown exuviae.
All cocoons in the wild were spun under stones of medium size and situated not far from the host-plant. Not a single one was found exposed or spun on vegetation. From the cocoons obtained from larvae found in the wild at the end of June 2006, the moths emerged after 14 days in Iran (first female e.p.: July 12, 2006), while the cocoon phase in Germany lasted two days longer. The first male and female emerged from cocoons obtained from the ab ovo culture after 16 days (May 20 and 21, 2007). Three more males and three females emerged up until May 28, 2007.

Infraspecific differences in preimaginal and imaginal phenotypes

The moths of both western populations (Kuh-e Samamus, Gardaneh-ye Tondrokosh) are not melanistic. They are smaller than the melanistic populations from Alam-Kuh and Kuh-e Tochal. Consequently, the larvae and cocoons do not reach the same size. In the last and penultimate instars the larvae from Kuh-e Samamus (Figs 34–35) are clearly darker than those from Kuh-e Tochal (Figs 32–33). The ground-coloured mediodorsal band is narrower or can even be lost, thus giving the larva a completely black dorsum. The pigmentation subdorsally and laterally is stronger, too. The most darkened larvae are reminiscent of a larva of a *Parnassius* sp. (Fig. 43). The extension of the dark pigmentation can be a subspecific adaptation to the extreme weather conditions so close to the Caspian Sea where, at the time of the final larval development, the periods of fog, cold wet winds and little sunshine can be normal. On four trips to this locality between the end of June and mid July we had rain, wind and very low temperatures on three occasions (Fig. 37). But when the sun came through, the larvae immediately started climbing up the plants, warming up and feeding. In contrast to the larval phenotype, the imaginal phenotype is not melanistic. Probably the conditions some weeks later during the flight period of the moths are more stable on average and/or the lower altitude of

Figs 39–45. Kuh-e Samamus, larvae of *Z. speciosa* on different host-plants and syntopic *Z. carniolica*, 30.vi.2006. **39–40.** The majority of the fully grown larvae of *Z. speciosa* were found on the yellow-flowered *Trachydium depressum*. **41.** Two larvae feeding on one plant of the whitish-flowered *Trachydium eriocarpum*, also a host-plant. **42.** A third, unidentified Apiaceae on which larvae were found feeding. **43.** Fully grown larvae – especially when partly hidden – resemble larvae of *Parnassius* species, 30.vi. 2006. **44–45.** *Zygaena carniolica* accompanies *Z. speciosa* in all its known localities. The moths of *Z. carniolica* prefer to nectar on the globe-like flowers of a second *Thymus* sp. that is growing in this area.

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the biotopes (3,270–3,400 m; compared with those from Tochal, 3,500–3,800 m and Alam Kuh, 3,200–4,000 m) allows enough activities for nectaring and reproduction so that no melanistic adaptation has evolved to absorb more solar radiation. Not a single melanistic form was found here although around 150 moths were observed, while all the moths from Alam-Kuh, Kuh-e Tochal, and Dizin-Shemshak (ca. 200 specimens) are melanistic.

Further field observations and larval host-plants

At Kuh-e Tochal larvae were found during the early afternoon under small stones or at the base of plants of *Semenovia tragioides* (Boiss.) Manden (det. H. Akhani), a very characteristically smelling, white-flowering Apiaceae. At the end of June 2006 the host-plant was not in flower; the flowering stems, however, were protruding. The first larva that was found on August 3, 2005 was parasitised by a species of Chalcididae. On June 28, 2006, more than a dozen larvae were found; of these, nine were fully grown, while five were of medium size or even smaller and some of the latter were entering diapause for a second time. Just before the appearance of the moths, two more larvae of medium size were found on July 19, 2006; both went into a second diapause, thus confirming the above observations. The same was observed with larvae from Kuh-e Samamus. Of nine larvae, only one made a cocoon the same year, three went into diapause and the rest died or were parasitised. Based on these observations, one can assume that two over-wintering periods are the general strategy of this high-mountain species, as all larvae from the ab ovo culture also went into a second diapause.
Host-plants used by larvae exhibit a characteristic look: as the larvae feed on the flowering stems, the latter are bent over or they are without umbels, as the larvae preferably eat these parts. Because of this behaviour, the plants on which the larvae feed look different and acquire a cushion-like form.
The temperature at this altitude falls very quickly when clouds or fog that emanate from the Caspian Sea prevent direct sunshine. The activity of the moths is more or less restricted to the warmest time of the day, i.e. between 11.00 and 15.00 h. The few observed and freshly emerged females had a heavy flight, but two males were observed to fly very quickly; one female was seen nectaring on thyme.

At Kuh-e Samamus the biotopes have a west- to north-west-facing aspect. In contrast to Kuh-e Tochal and the pass between Dizin-Shemshak, the larvae here feed on three different Apiaceae with a slight preference for the yellow-flowering Apiaceae. Feeding larvae were found on *Trachydium eriocarpum* Born. & Gauba (white-flowering), *Trachydium depressum* (Bois.) Bois. (yellow-flowering) and another Apiaceae (probably *Peucedanum* sp. or *Semenovia* sp.) (all det. H. Akhani / Tehran). However, the definitive determination needs confirmation as the plants were just flowering and no seeds could be found.
The plants do not grow as high as those on Kuh-e Tochal but are somewhat prostrate or close to the ground.

Around midday the moths were observed visiting the 'polsters' or cushions of two different *Thymus* spp. and nectaring at their flowers; some were active on one polster for more than 10 minutes and crawling from one flower to the next. During periods when the wind abates and the sun is fully shining, the moths immediately come out and warm up on the sun-exposed sides of stones. We observed this behaviour even at low temperatures of 12–13°C at the beginning of the flight period (June 30, 2006). During the main period (mid July to beginning of August), the moths can immediately appear in abundance and begin to fly when it becomes sunny and less windy for a moment in the habitat. But when the sun is hidden or the wind is too strong, they land or fall down to the ground and crawl under stones. The flight is steady and calm, 20–30 cm above the ground when it is windless; then they are probably searching for nectar plants or the males for females. But males were regularly observed flying 1–5 m high and very quickly, especially when crossing the saddle of the mountain ridge.
Two virgin females from Kuh-e Tochal (ex larvae) were placed in gauze-covered boxes for checking their attractiveness to the males of the population at Kuh-e Samamus. At one single stop, eight males arrived and tried to reach the females, their valvae opened and ready for mating.

From both localities, parasitoids (Hymenoptera and Diptera) were obtained from larvae collected in the wild. A complete list with all known parasitoids will be published later.

Biotope(s). On Kuh-e Tochal four biotopes inhabited by *Z. speciosa* were discovered between 2005 and 2007, all of them situated on the south side of the mountain. The maximum distance from each other is around 3 km; the lowest is situated at 3,390 m, the highest at 3,680 m altitude. In all these sites the larval host-plant *Semenovia tragioides* is common and flowering at the time of appearance of the moths. The sub-populations are only weakly isolated by areas where the larval host-plant does not grow. However, each site is visible from one habitat to the next and there are no isolating barriers between them. Consequently, the population exhibits a typical metapopulation structure. All sites are very steep, westerly facing biotopes with moving stones (scree) and abundant *Semenovia tragioides*, dominated by Poaceae with *Thymus* sp., *Salvia* sp., and *Onobrychis cornuta* cushions.
The other biotopes at Dizin – Shemshak, Hecarčal, Gardaneh-ye Tondrokosh and Kuh-e Samamus are all westerly (south-west to north-west) facing. There can be no doubt that the general warming up of the biotope and the longer evening sun is the deciding factor.

Zygaena cacuminum Christoph, 1877

"*Zygaena cacuminum* Chr." Christoph 1877: 243, pl. 6 fig. 17. Type locality: "auf dem mit Steingeröll bedeckten Plateau und den höchstgelegenen Abhängen des Felskammes bei Schahkuh" (original description); [Iran, prov. Golestan, Gorgan 37 km S., Shah-kuh-e Pain 6 km SE., Kuh-e Gawkoshan (3,813 m)]; (see distribution map, loc. no. 7).

No information is provided on the number of specimens that were collected, but both sexes are mentioned. One specimen (probably ♂) is illustrated in a hand-coloured figure.

The rediscovery of *Z. cacuminum* around 120 years after it was first discovered by Christoph is described by Hofmann (2000d) and Naumann (2000) who also provide data on the biology and ecology (phenology, host-plants etc.). Until 2005, *Z. cacuminum* was one of the rare burnet moth species (like *Z. problematica* and *Z. halima*) that was known only from its type locality. Here *Z. cacuminum* – according to the original description – inhabits biotopes in the highest regions of the Shahkuh range. The rediscoveries in 1998 (B. Mollet), 1999 (A. Hofmann, J.-U. Meineke, B. Mollet), 2000 (B. Mollet), 2003 (A. Hofmann, J.-U. Meineke), 2005 (A. Hofmann, B. Mollet) as well as material collected by T. Keil (2003, 2006) were all on the north side of the mountain range in the boulder/scree zone between 2,800 and 3,100 m altitude.

If one proceeds around 25–30 km eastward from Shahkuh, as the crow flies, one reaches the highest peak of the eastern Alborz, a mountain known as Kuh-e Shavar (3,945 m). On its north side, this mountain is covered with forests that extend down to the Caspian Sea, while the slopes on its west, east and south sides are almost treeless with poor, high-mountain steppe vegetation (*Artemisia*, *Acantholimon*, etc.) where only isolated *Juniperus* trees occur. A typical high-mountain flora with cushion vegetation (*Astragalus* spp., *Onobrychis cornuta*) is found from above 2,500 m. Five permanent rivers rise from this mountain. Near the village of Tash, a trail that follows the course of one of these rivers leads to a coal mine in this mountain. Kuh-e Shahvar is visible from the upper parts of Shahkuh, but both are well separated from each other by deep valleys in which there is intensive cultivation of the land. It had already been assumed by Naumann (2000) and Hofmann that suitable biotopes for *Z. cacuminum* should exist on this mountain, which is why both explored this area several times, but without any success. A definitive clue that *Z. cacuminum* in fact has a population there was given when H. Akhani showed the author *Zygaena* photographs for determination, which he had made during his botanical fieldwork in 1998–2001. There was no doubt that one photograph depicted a fresh male of *Z. cacuminum* nectaring on *Acantholimon*. The photograph was taken at the end of July while Akhani was on his way from the village of Tash to the top of Kuh-e Shahvar at an altitude of about 3,350 m. Provided with this information, A. Hofmann and B. Mollet intensively explored the slopes of the two peaks of Kuh-e Shahvar from July 24–27, 2005, viz. the lower peak (Kuh-e Shahvar kucek) on the north side and the higher one (Kuh-e Shahvar bozorg) further south. At both sites the very local, white-flowering, larval host-plant *Trachydium eriocarpum* was found. At Kuh-e Shahvar kucek, *Z. cacuminum* was observed on both sides (north- and south-facing) of a ridge where the moths were flying and nectaring between 3,300 and 3,550 m altitude. The highest record is from Kuh-e Shahvar bozorg where a single male was found close to the snowfields at an altitude of 3,720 m. On both mountains, *Z. cacuminum* was accompanied by *Z. ecki* and *Z. carniolica*.

As a consequence of these new records, the expectation of finding *Z. cacuminum* at further localities in eastern Iran (Kuh-e Aladag, Kuh-e Binalut) becomes more realistic.

The relationship of *Z. speciosa* and *Z. cacuminum* will be discussed when more concrete facts are available, based on successful exploration of the areas between Demavend and Semnan.

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Review of the genus *Phocoderma* Butler, 1886 (Zygaenoidea: Limacodidae)

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Abstract. The genus *Phocoderma* Butler, 1886 is reviewed. Three externally similar species have been associated with the genus so far; the synonymy of *P. velutina* (Kollar) and *Natada rugosa* Walker is verified and a new species, *P. witti* sp. n., is described (type locality: Myanmar, 21 km E Putao, Nan Sa Bon village, 550 m; holotype in Museum Witt Munich, Germany). The three recognized species differ in male genitalia and in several newly found external characters.

Zusammenfassung. Die Gattung *Phocoderma* Butler, 1886 wird revidiert. 3 sehr ähnliche Arten wurden bisher in der Gattung beschrieben. Die Synonymie zwischen *P. velutina* (Kollar) und *Natada rugosa* Walker wird bestätigt und eine neue Art, *P. witti* sp. n., wird hier beschrieben (Typusort: Myanmar, 21 km E Putao, Nan Sa Bon village, 550 m; Holotypus im Museum Witt München, Deutschland). Die Arten unterscheiden sich deutlich in den männlichen Genitalien; auch einige neue Unterscheidungsmerkmale werden im Habitus festgestellt.

Резюме. К настоящему времени известно только два вида рода *Phocoderma* Butler, 1886, внешне очень похожих. В результате этого исследования была подтверждена синонимия между видами *P. velutina* (Kollar) и *Natada rugosa* Walker и описан новый для науки вид *P. witti* sp. n. (типовая местность: Myanmar, 21 km E Putao, Nan Sa Bon village, 550 m; голотип хранится в Museum Witt Munich, Germany). Виды рода *Phocoderma* Butler, 1886 хорошо отличаются друг от друга особенностями строения гениталий самцов, но также были найдены внешние диагностические признаки.

Introduction

Phocoderma Butler (1886: 4) was described as monotypical with type species *Gastropacha velutina* Kollar (1844: 473). By 1886 two species names were associated with the genus – *velutina* and *rugosa* Walker, 1855, both from the Indian region; they were synonymized by Butler (1886). In 1896 Druce (1896: 236) described a new species, *P. betis*, from South-West China. Since that time the genus was believed to contain only two these species (Hering 1931: 720).

As a result of this review, three valid species differing in male and female genitalia, characters of the labial palp and forewing pattern are recognized. The previous synonymy of *P. velutina* and *Natada rugosa* Walker was re-evaluated in the context of newly found characters. All characters usable for species identification are illustrated and distribution maps are given for each species.

Material and methods

This work includes a study of the type material of all species-level names associated with genus *Phocoderma* to verify their status. The female holotype of *Gastropacha velutina* was examined at the NMW (see list of abbreviations below), the types of both *Natada rugosa* Walker and *Phocoderma betis* Druce were studied at the BMNH. Also, numerous additional specimens were studied to analyze the geographical distribution

of all taxa and to test characters that might be usable for identification. Moths kept in the MWM formed the basis of this study; but material from ZSM, ZISP, NSMT, and BMNH was also considered, totaling approximately 200 specimens.
Genital slides were prepared and stained using the method of Hardwick (1950), the vesica was inverted, and the genitalia were mounted in Euparal. The moth images were taken with a Nikon Coolpix 5400 E digital camera and the images of genital structures were taken through a MBS-10 binocular microscope and later re-worked using Corel Photo Paint 11.
In the species descriptions below the ratios concerning labial palps always include scale covering.

Abbreviations

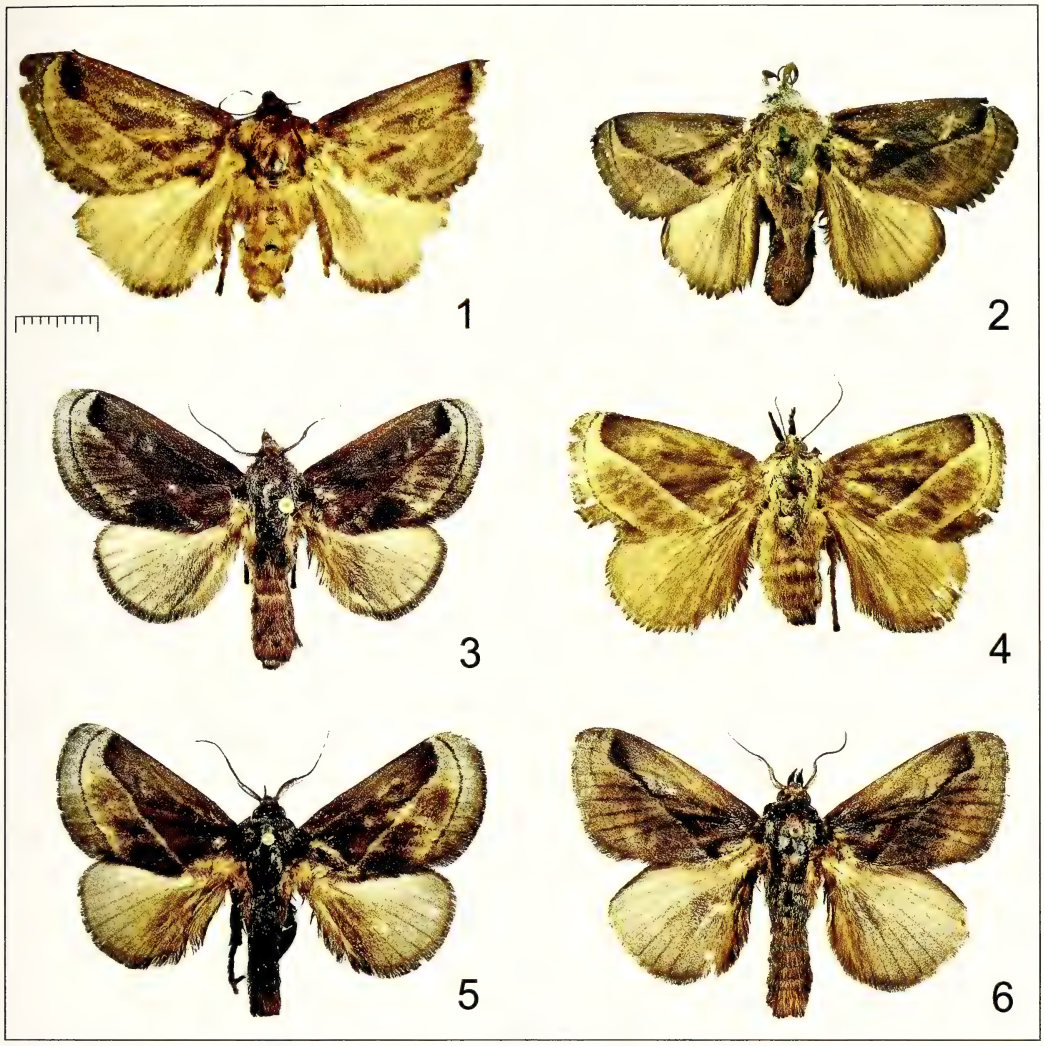
BMNH	The Natural History Museum; London, Great Britain
GU	genital preparation
MWM	Entomological Museum Thomas J. Witt; Munich, Germany (to be transferred to ZSM)
NMW	Naturhistorisches Museum Wien; Vienna, Austria
NSMT	National Science Museum (Natural History); Tokyo, Japan
ZISP	Zoological Institute of Russian Academy of Sciences; St. Petersburg, Russia
ZSM	Zoologische Staatssammlung der Bayerischen Staaten; Munich, Germany

Results

Phocoderma Butler, 1886

Phocoderma Butler, 1886: 4. Type-species: *Gastropacha velutina* Kollar, 1844: 473.

Diagnosis. All species very similar in appearance and among the largest limacodids of the Oriental Tropics with wingspans of 51–72 mm (Figs 1–6). Ground colour various shades of brown. Body stout. Antennae bipectinate in male and filiform in female. Labial palps directed anteriorly (Figs 7–12). Proboscis vestigial, as long as first segment of labial palps, and spiraled in 1.5 turns. Foretibia with white distal patch. Species without sexual dimorphism, but females usually larger than males and more robust, with stouter body. Forewing elongate, with curved darker submarginal fascia parallel to external margin, and area basal to this divided by oblique line with subapical curvature. Venation identical in all species, conforming to ground plan of Limacodidae but with several diagnostic features (Fig. 13) (Holloway 1986: 100): forewing with medial stem branched distally; Sc slightly sinusoidal, A1+A2 with basal fork and with 6 pseudoneuria (or vestigial veins) from common stem of anal vein to lower margin of wing; R3+R4 stalked from R5. Hindwing with short oblique crossvein between Sc+R1 and Rs.
Male genitalia (Figs 14–20). Complying with limacodid ground plan (sensu Holloway 1986: 50); uncus simple, strong, wide basally, apically narrow; gnathos strong, curved at right angle medially; valvae without saccular process; transtilla interrupted medially ("hemitranstilla" of Stekolnikov & Kuznetzov 1981: 536) present;



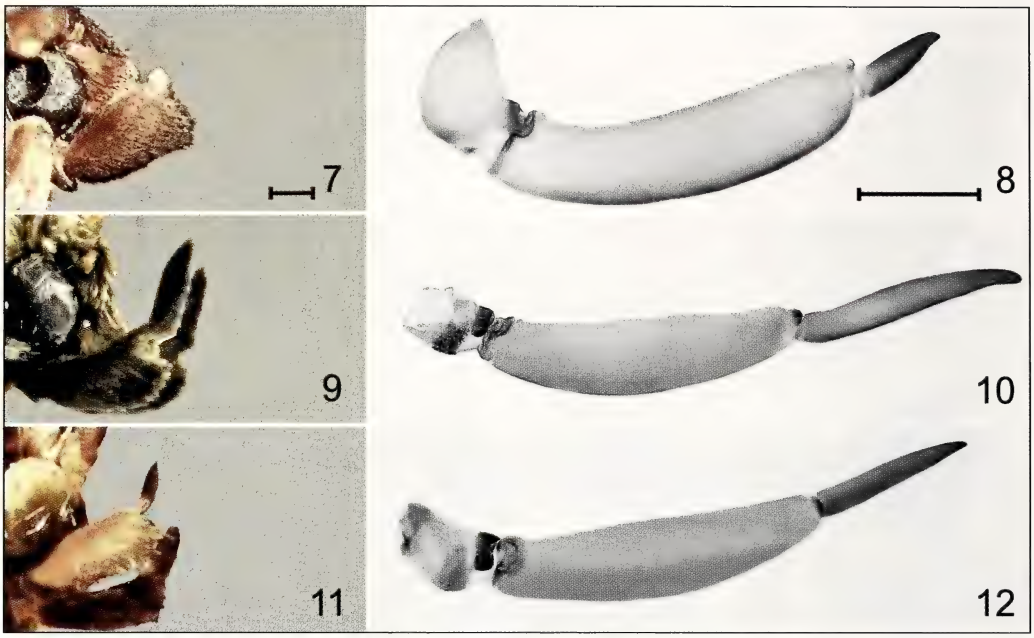
Figs 1–6. *Phocoderma* spp. **1**. *P. velutina* (Kollar), holotype, ♀ (NWM). **2**. *P. velutina* (Kollar), holotype of *Natada rugosa* Walker, ♂ (BMNH). **3**. *P. velutina* (Kollar); Borneo, Selatan, ♂. **4**. *P. betis* Druce, holotype, ♀ (BMNH). **5**. *P. betis* Druce; China, Simao, ♂. **6**. *P. witti* sp. n., holotype, ♂ (MWM). Scale bar: 1 cm.

phallus very long, mostly straight, with characteristic dorsoapical process of variable shape; juxta flattened, ellipsoidal (Fig. 14).

Female genitalia (Figs 21–30). Both pairs of apophyses well developed, apophyses posteriores 1.5 times longer than anteriores, as long as height of ovipositor lobes (Figs 21, 22); antrum strongly sclerotized, much broader than ductus bursae, curved; ductus bursae very long, spiraled; corpus bursae ovoid, with paired signum.

Larva. Of the "nettle" type, as described below in specific account of *P. velutina*.

Remarks. The genus consists of three species, one of them being described here as new. All three are very similar in appearance, but easily distinguished from one



Figs 7–12. Labial palps of *Phocoderma* spp., ♂♂. **7**. *P. velutina* (Kollar); Indonesia, Aceh (Sumatra). **8**. The same without covering scales; Malaysia, Sabah (Borneo). **9**. *P. betis* Druce; China, Shaanxi. **10**. The same without covering scales. **11**. *P. witti* sp. n., paratype; India, Assam. **12**. The same without covering scales; paratype; Myanmar, Putao District. Scale bar: 1 mm.

another by genitalic characters, especially by the shape of the apical process of the phallus. External diagnostic characters are also available: the ratio between the 3rd and the 2nd segments of the labial palps as well as characters of the apical curvature of the forewing's postmedial line (for details see specific accounts).

Distribution. From India to Sundaland, including Nepal, Myanmar, China, Thailand, Vietnam, Peninsular Malaysia, Sumatra, and Borneo.

Phocoderma velutina (Kollar, 1844) Figs 1–3, 7, 8, 15, 16, 21, 23–27, 31

Gastropacha velutina Kollar, 1844: 473. Type locality: [north India] "Himal., Massuri". Holotype: ♀, in NMW.

Natada rugosa Walker, 1855: 1109. Type locality: "Scinde?". Holotype: ♂, in BMNH. Synonymy established by Butler (1886: 4).

Natada velutina Kollar; Hampson 1892: 382; Hering 1933: 343.

Phocoderma velutina Kollar; Butler 1886: 4; Leech 1899: 103; van Eecke 1925: 27; Holloway 1982: 40, pl. 2 fig. 24; Holloway 1986: 100, pl. 7 figs 163, 164, 168; Holloway 1990: 49, pl. 2 fig. 25; Yoshimoto 1994: 86.

Phocoderma velutinum Kollar; Hering 1931: 720.

Description. Male (Figs 2, 3, 7, 8). Expanse 45–60 mm, forewing length 20–26 mm. Ratio of length of 3rd : 2nd segments of labial palps from 1 : 10 to 1 : 3, and ratio of width of 3rd : 2nd segments from 1 : 6 to 1 : 2.5.

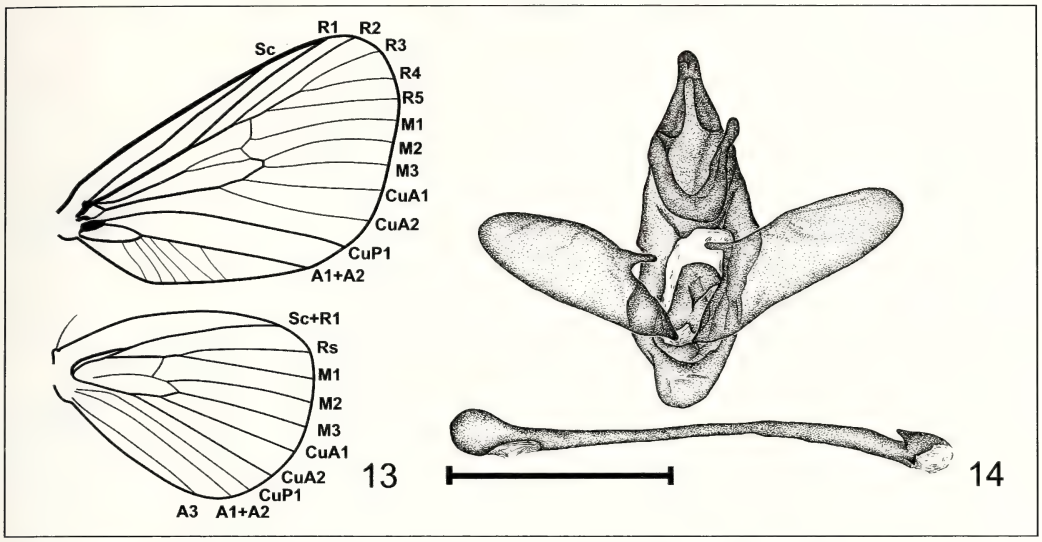


Fig. 13. Wing venation of *Phocoderma velutina* (Kollar); Malaysia, Sabah (Borneo).

Fig. 14. Male genitalia of *Phocoderma witti* sp. n., holotype, GU N° 10008. Scale bar: 5 mm. Apex of phallus oriented to the right.

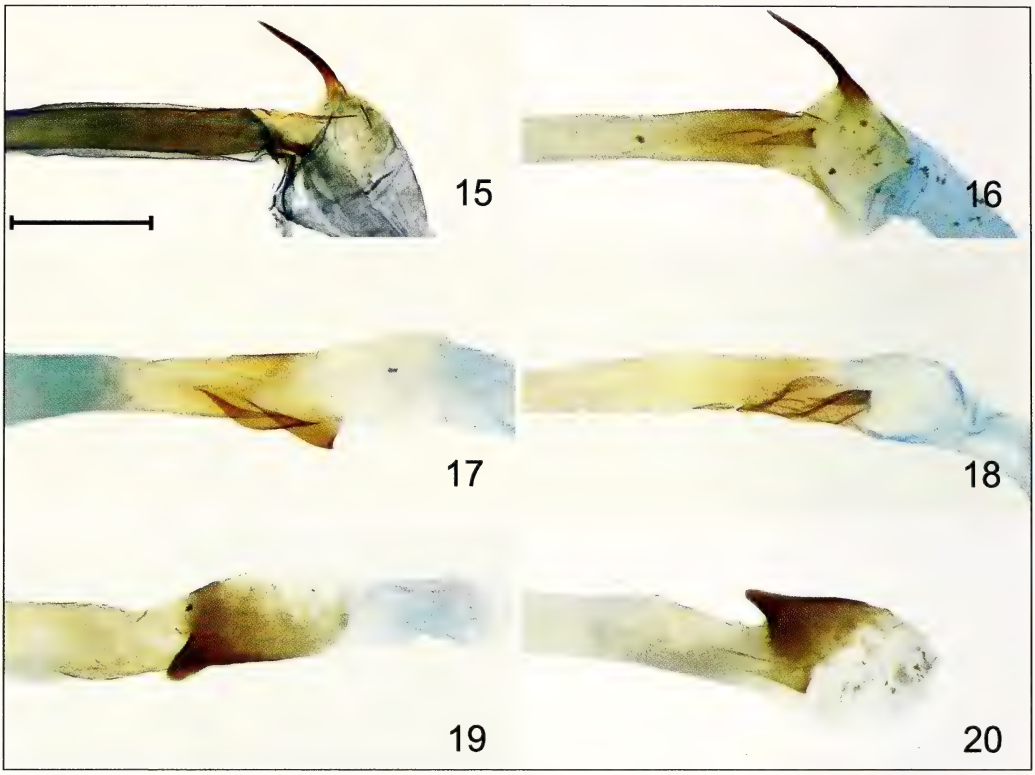
Male genitalia (Figs 15, 16). Uncus narrow with strong sclerotized apex. Gnathos long, strong, with slight curvature. Valvae elongate, of variable shape. Juxta lamellar. Phallus tube-shape, long, very narrow, slightly curved, with long narrow apical process, curved back at 30–40°. Ratio of length of valvae to length of phallus from 1 : 2.3 to 1 : 3.

Female (Fig. 1). Expanse 51–72 mm, forewing length 23–30 mm. Ratio of length of 3rd : 2nd segment of labial palps from 1 : 5 to 1 : 3, and of width of 3rd : 2nd segments from 1 : 7 to 1 : 1.5.

Female genitalia (Figs 21, 23–27). Ductus bursae very long, narrow. Corpus bursae rounded, with diffused linear double signum. Shape of signum variable; ratio of length of maximal width of each half to its length from 1 : 10 to 1 : 5, and of medial width of each half to its length from 1 : 10 to 1 : 5.

Diagnosis. Externally this species is very similar to *P. betis* Druce, but the subapical curvature of the forewing oblique line extending from the wing base to the submarginal fascia is more angular. Also very similar to *P. witti* sp. n., but the 3rd segment of the male labial palp is distinctly shorter than in both other species (see Descriptions). Gnathos strong, narrow, with weak curvature. Phallus longer than in *P. betis*, with narrow, strong and recurved apical process. Signum narrower than in *P. betis*.

Biology. A mature larva is illustrated in colour by Lewvanich (2001: 95, fig. 64). Body with long scoli: length of dorsolateral scoli on segments T3, A1, A7, and A8 about 20 mm at maturity, other dorsolateral scoli 7 mm long, shorter than lateral ones. The ground colour of the body is different tints of green: from yellowish green to pale grayish green, including scoli; lateral and A8 dorsolateral scoli with black tips; scoli situated at intersections of network of transverse and longitudinal bands of ground



Figs 15–20. Apical part of phallus of *Phocoderma* spp. **15**. *P. velutina* (Kollar), holotype of *Natada rugosa* Walker. **16**. *P. velutina* (Kollar); Myanmar, Tenasserim, GU N° 10007 MWM. **17**. *P. betis* Druce; China, Shaanxi, GU N° 9997 MWM. **18**. *P. betis* Druce; China, Yunnan, GU N° 10010 MWM. **19**. *P. witti* sp. n., paratype, GU N° 9995 MWM. **20**. *P. witti* sp. n., holotype, GU N° 10008 MWM. Scale bar: 1 mm.

colour enclosing horizontal blue ellipses dorsally and pale grayish green oblique ellipses laterally on each segment.

The larvae are gregarious when young, living on the underside of leaves, eating the epidermis. They separate on the host-plant when larger and often defoliate whole trees. Pupation occurs on the soil surface in a solid, grey, rough ovoid cocoon (Holloway 1986: 100).

The recorded host-plants are *Lannea*, *Mangifera* (Anacardiaceae), *Sapium* (Euphorbiaceae), *Terminalia* (Combretaceae), *Bombax* (Bombacaceae) (Holloway 1986: 100); *Aleurites* (Euphorbiaceae), *Butea monosperma* (Leguminosae), *Nephelium lappaceum* (Sapindaceae), *Camelia sinensis* (Theaceae) (Robinson et al. 2001: 323).

The flight period is from March to December. The species has been found in habitats situated between altitudes of 150–1900 m and probably is bivoltine.

Distribution (Fig. 31). India, Nepal, Myanmar, Thailand, Malaysia (Taman Negara), Borneo, Sumatra.

Remarks. The synonymy of *P. velutina* (Kollar) and *Natada rugosa* Walker (Fig. 2) is verified on the basis of the external characters of the holotypes, by comparing the locations of their type localities, and by the distribution patterns of all *Phocoderma*

species. Unfortunately, the abdomen of the type specimen of *P. velutina* (Kollar) is strongly damaged (by pests?) and important characters have been lost. A preparation was made and only the ovipositor lobes were found undamaged. The labial palps are also broken. But *rugosa* and *velutina* are the only species of the genus known from north India.

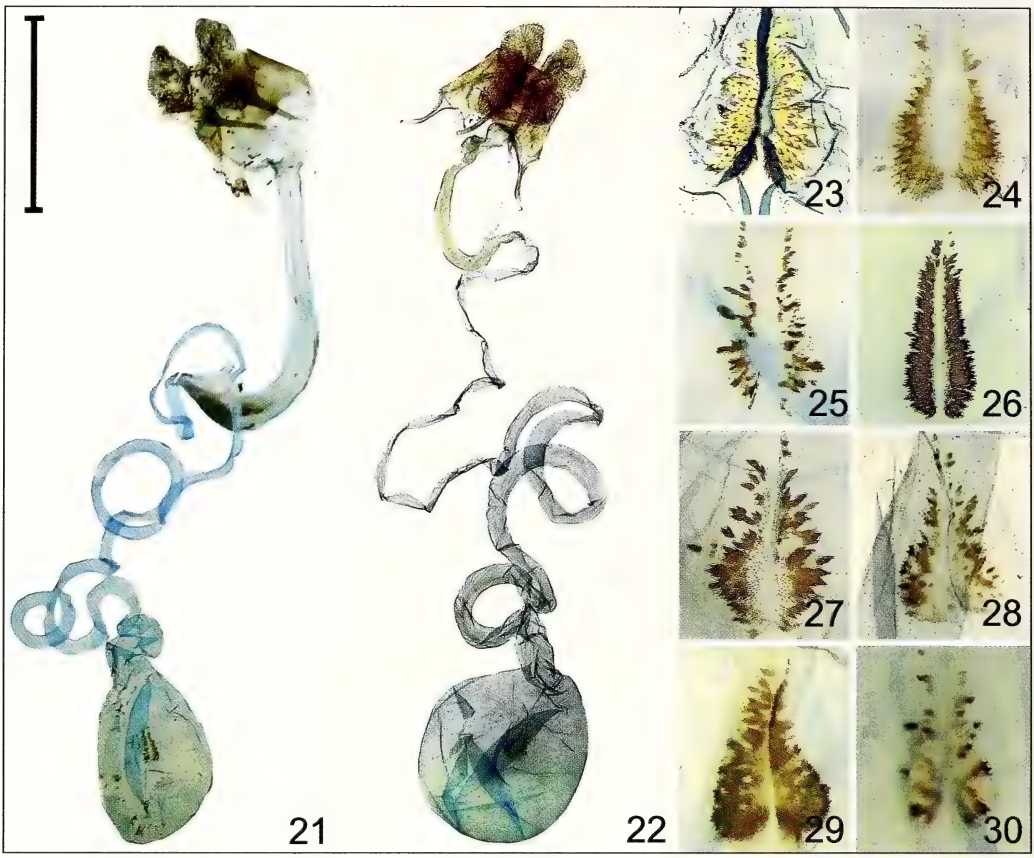
Phocoderma betis Druce, 1896 — Figs 4, 5, 9, 10, 17, 18, 22, 28–30, 32

Phocoderma betis Druce, 1896: 236. Type locality: "China, Hunan". Holotype: ♀, in BMNH.
Phocoderma betis Druce; van Eecke 1925: 27; Hering, 1931: 720.

Description. Male (Figs 5, 9, 10). Expanse 42–60 mm, forewing length 20–30 mm. Forewing with subapical curvature of oblique line extending from basal part to submarginal fascia distinctly rounded, never joined with submarginal fascia. Ratio of length of 3rd : 2nd segment of labial palps from 1 : 3.5 to 1 : 1.5, and of width of 3rd : 2nd segments from 1 : 3.5 to 1 : 1.5.
Male genitalia (Figs 17, 18). Uncus narrow. Gnathos long, strong. Valvae elongate. Juxta lamellar. Phallus tube-shaped, long, narrow, slightly curved, with two apical parallel crest-shaped processes, distal crest with short medial point.
Female (Fig. 4). Expanse 55–65 mm, forewing length 28–32 mm. Ratio of length of 3rd: 2nd segment of labial palps 1 : 2 to 1 : 1.5, and of width of 3rd : 2nd segments from 1 : 2 to 1 : 1.5. Ratio of length of valvae to length of phallus from 1 : 2 to 1 : 2.2.
Female genitalia (Figs 22, 29, 30). Ductus bursae very long, narrow. Corpus bursae rounded, with heart-shaped signum variable. Ratio of length of maximum width of lateral part of double signum to its length from 1 : 3.5 to 1 : 3, and medial width of lateral part of double signum to its length from 1 : 5 to 1 : 3.5.
Diagnosis. Forewing pattern characteristic: subapical curvature of oblique line extending from base to submarginal fascia distinctly rounded, much more so than in other two species, never joined with submarginal fascia. Third segment of labial palp in male longer than in *P. velutina* (Kollar), almost as long or a slightly longer than in *P. witti* sp. n. Phallus shorter than in other species, with two parallel crest-shaped apical processes. Signum broader than in *P. velutina* (Kollar), heart-shaped.
Biology. Little known: flight period from May to September; the species was collected at altitudes of 800–3500 m. The immature stages are unknown.
Distribution (Fig. 32). China (Shaanxi, Hubei, Zhejiang, Sichuan, Hunan, Guanxi, Simao and Yunnan), Northern Thailand (Changwat Nan), Northern Vietnam (Lai Chau).

Phocoderma witti sp. n. — Figs 6, 11, 12, 19, 20, 32

Material. Holotype ♂, 'Myanmar (Burma) | 21 km E Putao | Nan Sa Bon village | 550 m, 1–5.V.1998 | leg. Murzin & Sinjaev | Museum Witt', 'Genitalpräparat | Heterocera | Nr. 10.008 | Museum WITT München', MWM. – Paratypes: 10♂, same data as holotype. 7♂, **Myanmar** (Burma), Putao, 500 m, 27.iv.1996, leg. Murzin & Sinjaev, MWM (GU Nr. 9995). 3♂, Myanmar N (Burma), Putao, H=500 m, 23.v.1998, leg. V. Murzin, V. Sinjaev, MWM. 7♂, Myanmar (Burma), 65 km NE Putao, Zi Yar Dam



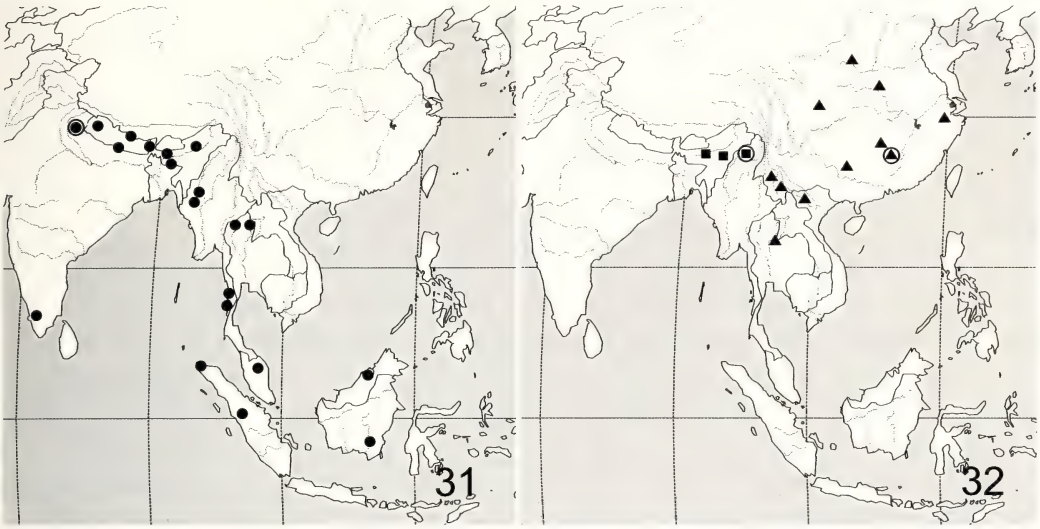
Figs 21–22. Female genitalia of *Phocoderma* spp. **21**. *P. velutina* (Kollar); India, Kerala, GU N° 10013 MWM. **22**. *P. betis* Druce, type. Scale bar: 5 mm.

Figs 23–30. Signum variability of *Phocoderma* spp. **23**. *P. velutina* (Kollar); Sumatra, GU N° 634 JDH of BMNH. **24**. *P. velutina* (Kollar); Nepal, GU N° 10029 MWM. **25**. *P. velutina* (Kollar), GU N° 10002 MWM. **26**. *P. velutina* (Kollar); Myanmar, Tenasserim, GU N° 10003 MWM. **27**. *P. velutina* (Kollar); GU N° 11117 MWM. **28**. *P. betis* Druce, type. **29**. *P. betis* Druce; Thailand, Changwat Nan, GU N° 10001 MWM. **30**. *P. betis* Druce; China, Sichuan, GU N° 11082 MWM.

village, 950 m, 18–21.v.1998, leg. Murzin & Sinjaev, Museum Witt, MWM (GU Nr. 11.127). 1♂, Myanmar (Burma), 16 km E Putao, Kaung Mu Lon village, 500 m, 28–30.iv.1998, leg. Murzin & Sinjaev, MWM (GU Nr. 12.301). 3♂, NE-**India**, Assam, Nameri Nat. Park, 40 km N Tezpur, 150m, 27°20'N, 93°15'E, 24.vii.–2.viii.1997, leg. Sinjaev & Murzin, MWM (GU Nr. 11.128). 2♂, NE-India, Assam, W. Meghalaya, Garo Hills, Nokrek National Park, 25°40'N, 91°04'E, 1150 m, 2–13.vii.1997, leg. Afonin & Sinjaev, MWM (GU Nr. 10.012 and 11.129). 1♂, Naga Hills, 2500–5000 ft., vi–viii.1889, W. Doherty, ZISP.

Description. Male (Figs 6, 11, 12). Coloration different tints of brown, tanned. Forewing pattern with oblique line extending from basal part to submarginal fascia with distinct curvature. Expanse 45–58 mm, forewing length 20–27 mm. Ratio of length of 3rd : 2nd segment of labial palps from 1 : 3 to 1 : 2.5, and of width of 3rd : 2nd segments from 1 : 3.5 to 1 : 1.5.

Male genitalia (Figs 14, 19, 20). Uncus narrow with strongly sclerotized apex. Gnathos long, strong, curved distally, distinctly hook-shaped. Valvae elongate. Juxta



Figs 31–32. Distribution of *Phocoderma* spp. **31**. *P. velutina* (Kollar). **32**. *P. betis* Druce (▲) and *P. witti* sp. n. (■). Symbols in a circle represent a type locality.

lamellar. Phallus tube-like, long, very narrow, slightly curved with short, broad, elongate, recurved dorsoapical process. Ratio of length of valvae to length of phallus from 1 : 2.3 to 1 : 3.

Female. Unknown.

Diagnosis. Externally this species is very similar to *P. betis*, but with the forewing subapical curvature of the oblique line extending from the base to the submarginal fascia more angular; without evident external differences with *P. velutina*, but 3rd segment of male labial palps as long or slightly smaller than in *P. betis* and longer and broader than in *P. velutina*. The hook-shaped gnathos and rounded apical process of the phallus are diagnostic; the phallus is longer than in *P. betis*.

Biology. Little known. Flight period from mid April to early August. All specimens were collected at altitudes of 150–1250 m.

Distribution (Fig. 32). North-east of India (Assam, Tezpur, Western Meghalaya), Northern Myanmar (district of Putao).

Etymology. The species is dedicated to Mr. Thomas J. Witt (Munich, Germany) for his constant support of my investigations of limacodid moths.

Conclusions

Genus *Phocoderma* now consists of three species with one of them (*P. witti*) here described as new, while the synonymy of *P. velutina* and *Natada rugosa* was verified.

Phocoderma velutina is the most widespread species of the genus. It is distributed from India and Nepal to Sundaland. In northern Myanmar and east India *velutina* flies in sympatry with *P. witti* and in northern Vietnam with *P. betis*.

The species of *Phocoderma* are very similar externally and the most useful features for species identification are in the male genitalia, especially the shape of the apical processes of the phallus: the single apical process of *P. velutina* is narrow, strong, curved basally; that of *P. betis* is made of two parallel sinusoidal crests; and that of *P. witti* is flat, broad basally, and rounded apically. Some useful external characters for identification were also found: the length of the 3rd segment of the male labial palps and the curvature of the forewing's fasciae.

The values of the ratios between the 3rd and 2nd segments of the labial palps are not discrete and should not be used for final species identification, but they are useful for sorting specimens. Nevertheless, the 3rd segment of the male labial palps in *P. velutina* is shorter than in the other species, while that of *P. betis* is longer, which was found to be unusual and remarkable. The ranges of values of these ratios are without distinct correlation to geographical distribution.

The phylogenetic relationships of *Phocoderma* and other limacodid genera are not clear, but this genus was placed in the "paired signum section" of the family by Holloway (1986: 54). Therefore, it is considered to be close to *Miresa* Walker, *Mahanta* Moore, *Scopelodes* Westwood, *Susica* Walker, and *Hyphorma* Walker.

Phocoderma moths have several unique or rare characters for limacodids. First of all, the length of the 3rd segment of the labial palps is not constant, showing great variability in ratios with the 2nd segment, and it differs in size between and within species. Secondly, the forewing has the medial stem branched distally and six pseudoneuria are present between the anal vein and the dorsal margin. Similar pseudoneuria can also be found in genus *Mahanta* Moore, but in different numbers, and this character can possibly represent a synapomorphy for these two genera.

Acknowledgements

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This new book is considerably different from all other works on the butterflies of Central Asia published during the past few years (Lukhtanov & Lukhtanov 1994; Tshikolovets, 1997, 1998, 2003, 2005, etc.). It covers the territory of Kyrgyzstan, south-eastern Kazakhstan, eastern Uzbekistan, and eastern Tajikistan (Pamirs), which includes many hardly accessible mountain ridges and highlands that are extremely interesting faunistically. The first volume is devoted to the Papilionidae, Pieridae, and Satyridae, which include 145 species in the region. The second volume treating the remaining butterfly taxa will be published soon.

The text consists of a small preface and very short but informative species essays written both in Russian and English. For every species the latin name, type locality, general distribution, habitats, flight-time, and host plants are mentioned. This is accompanied with color photos of the butterflies (male and female, sometimes from the underside as well) and dotted maps of distribution within the region of study. The special feature of the book is its high-quality photos of biotopes, butterflies and larvae in nature, and host plants. The bibliography is rather short and includes only the most important or the very last publications. Misprints (*Erebia kalmuca* instead of *E. kalmuka*; *Paralasa kuznezovi* instead of *P. kusnezovi*; a few wrong dates of publication) are scarce and probably inevitable in such a large work.

As a whole the book is well done and has both scientific and artistic value. This is quite comprehensible because its authors are very experienced field workers and the second author is a qualified taxonomist and photographer. This book will be very useful for professional lepidopterists, amateurs, and anyone interested in the butterfly fauna of the wonderful mountain lands of Central Asia.

Alexandr Lvovsky & Sergey Sinev

A new species of *Agdistis* Hübner, 1825 from Tajikistan (Pterophoridae)

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Abstract. *Agdistis tugai*, sp. n., is described based on two females collected in south Tajikistan. The habitat is a so-called tugai forest that consists of *Populus diversifolia* Schrenk trees and tamarisk shrubs (*Tamarix* sp.). The forest is surrounded by steppe. The adult and the female genitalia are illustrated. The type specimens will be deposited in the collection of the Natural History Museum of Basel, Switzerland (Naturhistorisches Museum Basel). Records for five other Pterophoridae species from Tajikistan are also given.

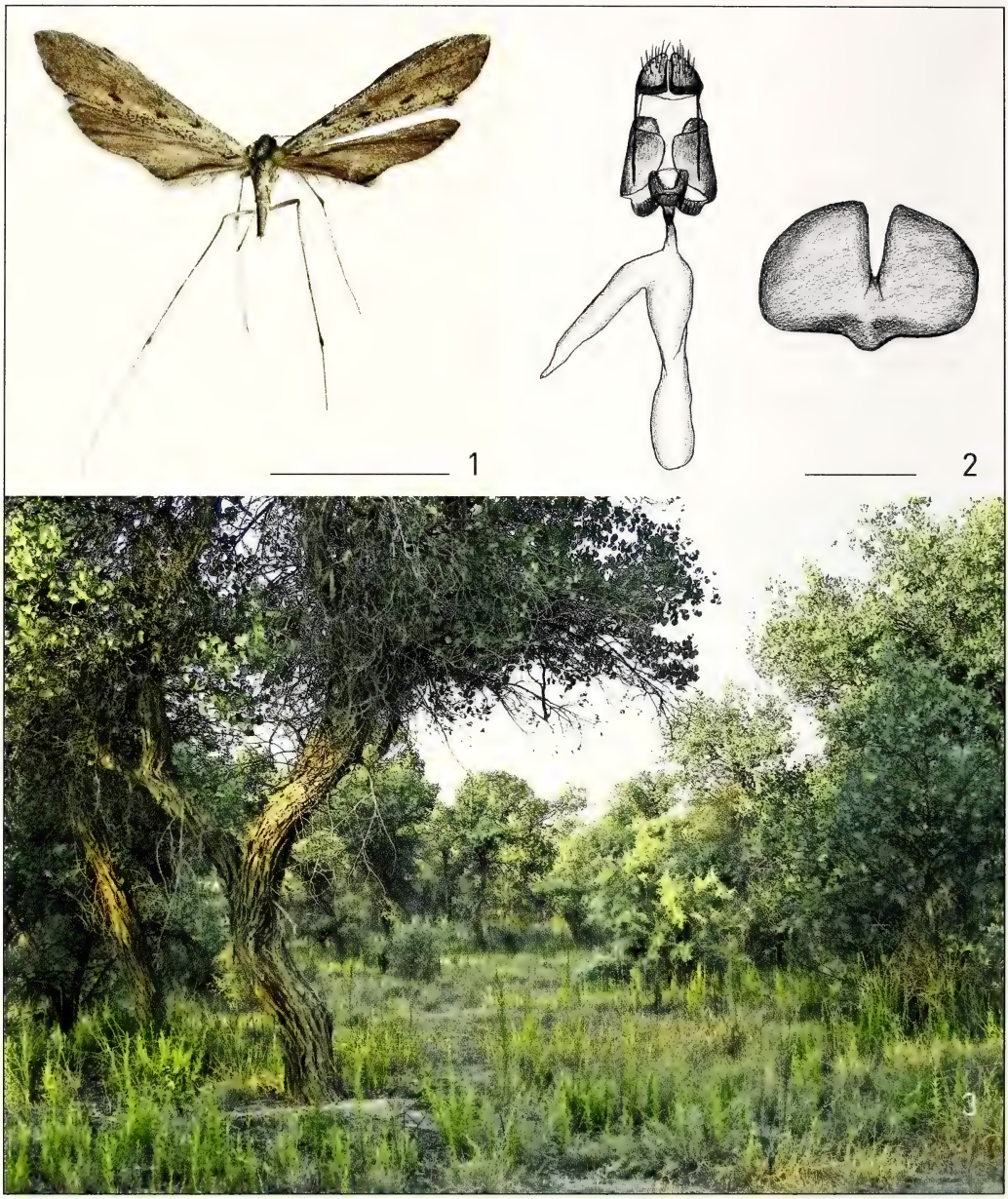
Introduction

Members of the genus *Agdistis* Hübner [1825] occur in the whole Palaearctic and are especially found in coastal areas and in Central Asian steppes (Arenberger 1995). About 100 species of *Agdistis* are known to date (Gielis 2003). The knowledge on Central Asian Pterophoridae is still incomplete, but the information regarding the genus *Agdistis* was summarized by Arenberger (1995). Because some countries of the area can now be accessed more easily, their attraction increased and several descriptions of new species followed (e.g. Alipanah & Ustjuzhanin 2006; Arenberger 1995, 2002; Ustjuzhanin 2001; Zagulajev 1990, 1996). Here I describe a new species of the genus *Agdistis* found in southern Tajikistan, close to the Afghan border. The species can be recognized easily by the female genitalia. It occurs in the only remaining large *Populus diversifolia* Schrenk (Salicaceae) forest at the confluence of the Vakhsh and Panj rivers.

Agdistis tugai sp. n. (Figs 1–3)

Material. Holotype ♀, 'TJ [Tajikistan] Tigrovaya Balka | Karalyevskaya Dacha | E 68° 23' 10" | N 37° 14' 00", 316 m | 6./7.vii.2007 LF | leg. F. Altermatt', 'Holotype | *Agdistis tugai* Altermatt ♀ | det. F. Altermatt'. – Paratype: 1 ♀, 'TJ [Tajikistan] Tigrovaya Balka | E 68° 24' 35.9" | N 37° 14' 29.8", 330 m | 5.vii.2007 LF | leg. F. Altermatt', 'Paratype | *Agdistis tugai* Altermatt ♀ | det. F. Altermatt'. The holotype and paratype are deposited in the NHMB.

Description. Adult female (Fig. 1). Alar expanse 26 mm, forewing length 14.5 mm. Head whitish to pale grey, frons creamy white with brown scales left and right of bulge. Lapial palpus creamy white to greyish, posterior end of each segment with few brown scales. Antenna grey, proboscis well developed. Vertex creamy white to grey with few brown scales. Forewing not cleft, whitish to greyish white with brown scales, speckled. Central field homogenously grey and slightly darker than rest of wing. Four brown costal markings: two most proximal markings well developed, two distal ones suffused and hardly visible. Four markings at dorsal margin of fold, 4th obliquely above 3rd, sometimes also fused. Cilia mostly white, dark grey on dorsal edge. Hindwing greyish,



Figs 1–3. *Agdistis tugai* sp. n. **1**. Holotype, female. Scale bar 10 mm. **2**. Female genitalia and 7th sternite. Scale bar 1 mm. **3**. Habitat: a tugai forest with *Populus diversifolia* trees and tamarisk shrubs (photo by T. Stalling).

plain-coloured. All legs whitish with brown scales; distal end of hindleg's 1st tarsomere brown. Caudal end of 7th sternite deeply carved.

Male. Unknown.

Female genitalia (Fig. 2). Apophyses anteriores absent. Apophyses posteriores long and slender, about 1.8 times length of papillae anales. Anterior third of papillae

anales conspicuously sclerotized. Antrum weakly sclerotized; caudal end (ostium) with two stub-shaped appendages fraying out at inner edge. Ductus bursae with weekly sclerotized collar. Corpus bursae without sclerites.

Diagnosis. *Agdistis tugai* sp. n. can be distinguished from most other *Agdistis* species by the absence of anterior apophyses, the weakly sclerotized antrum (exceptional in this genus) and the deeply carved 7th sternite. *Agdistis tugai* has only stub-shaped appendages on the antrum. The antrum of *A. tugai* is somewhat similar to the antrum of *A. mevlaniella* Arenberger, 1972, but the latter species has pronounced apophyses anteriores. The apophyses posteriores are relatively longer in *A. tugai* than in the recently described *Agdistis karakalensis* Zagulajev, 1990 (apophyses posteriores as long as papillae anales) and *Agdistis karabachica* Zagulajev, 1990 (apophyses posteriores about 1.2 times the length of papillae anales).

Habitat. A *Populus diversifolia* forest in Tigrovaya Balka. It is a typical riparian floodplain forest known as "tugai" where bushes of *Tamarix* sp. (Tamaricaceae) are common. Surrounded by steppe and desert and covering an area of about 50 km^2, Tigrovaya Balka is the largest remaining tugai forest. The forested area is officially protected (with the status of a "Zapovednik") and lies close to a prohibited zone at the country border. Nevertheless, the forest is highly threatened by illegal logging and desertification.

Distribution. The two available specimens were collected at two close-by sites in the Tigrovaya Balka in south Tajikistan. The sites are located about 15 km north-north-east of the confluence of the Vakhsh and Panj rivers. The species might also occur in the neighboring countries of Afghanistan and Uzbekistan.

Life history. Unknown.

Etymology. The name is taken from the habitat type at the type locality, which is known as a "tugai" forest.

Faunistic remarks. I have collected one female of *Agdistis mevlaniella* Arenberger, one female of *Agdistis tamaricis* (Zeller), and one male of *Crombrugghia distans* (Zeller) at the same locality and date as the holotype. I have also collected one male of *Marasmarcha colossa* Chapman and two females of *Tabulaephorus maracandicus* Arenberger & Buchsbaum at another location west of Dushanbe (Sharinav/Chotsch, E 68° 25' 10", N 38° 27' 56", 1800 m; 2.vii.2007). All individuals were collected at a light trap (12 W) during the first half of the night.

Acknowledgements

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Caryocolum siculum sp. n. (Gelechiidae), feeding on *Gypsophila* (Caryophyllaceae) in Sicily

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Abstract. *Caryocolum siculum* sp. n. from Central and South-Eastern Sicily (Italy) is described. Its larva feeds inside the internode of stems of *Gypsophila arrostii* Guss. (Caryophyllaceae). Morphological and bioethological data on adult, larva and pupa are provided.

Riassunto. L'Autore sulla base della diversa conformazione delle strutture genitali di entrambi i sessi, descrive *Caryocolum siculum* sp. n. Il nuovo taxon, appartenente al *petryi*-gruppo, è stato ottenuto dall'allevamento delle larve rinvenute nella Sicilia centrale (Monti Erei, Agira) e sud-orientale (Monti Iblei, Vizzini); le larve si nutrono e vivono all'interno del fusto della Caryophyllaceae *Gypsophila arrostii* Guss. Vengono forniti dati morfologici e bioetologici relativi ad adulto, larva e pupa, ottenuti da osservazioni effettuate direttamente sul campo ed in laboratorio.

Introduction

In the present paper a new species of *Caryocolum*, recently discovered in Central and South-Eastern Sicily (Iblei and Erei Mountains), is described. It was obtained from larvae feeding in galls of *Gypsophila arrostii* Guss. (Caryophyllaceae).

The genus *Caryocolum* Gregor & Povolný, 1954, includes about 70 described species. In Europe more than 50 species are recorded (Karsholt 2004), of which 28 occur in Italy; in Sicily only two species are dubiously recorded (Huemer & Karsholt 1995; Karsholt & Huemer 1995). Species of the genus *Caryocolum* have specialized in feeding exclusively on plants of the family Caryophyllaceae (Huemer 1988).

Abbreviations

TLMF Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria
ZMUC Zoologisk Museum, University of Copenhagen, Denmark

Caryocolum siculum sp. n.

Material. Holotype: ♂, **Italy**, Sicily, Prov. Catania, Iblei Mts., Vizzini, Contrada Rubalà, surroundings of Poggio del Vecchio, 320 m, 22.vi.2003, e.l. on *Gypsophila arrostii*, S. Bella leg. (genitalia slide 0074 S. Bella; coll. TLMF). – Paratypes: 1♀, same data as holotype, but 26.v.1999, e.l. on *G. arrostii*, S. Bella leg. (genitalia slide GU03/1202 P. Huemer; coll. TLMF); 4♂, 8♀, same data as holotype (including 1♀, 3♂ genitalia slides) but 22.vi.–7.vii.2003, e.l. on *G. arrostii*, S. Bella leg. et coll.; 3♂, 4♀, same data as holotype, but 15.–20.vi.2004, e.l. on *G. arrostii*, S. Bella leg. et coll.; 5♂, 4♀, Prov. Enna, Erei Mts., Agira, Vallone di Piano della Corte, Contrada Urselluzzo, 500 m, 20.–27.vi.2003 (including 1♀, 1♂ genitalia slides), e.l. on *G. arrostii*, S. Bella leg. et coll.; 1♂, 7♀, same data as holotype, but east of Lago Dirillo, 400 m, 27.iv.2006, e.l. on *G. arrostii*, leg. O. Karsholt (coll. ZMUC).

Diagnosis. The new taxon is well distinguishable from related species by its habitus and characters of the male and female genitalia. Genitalia characters are somewhat intermediate between species of the *petryi*-group and the *saginella*-group. As far as

Fig. 1. *Caryocolum siculum* sp. n., holotype.

known species of theses groups are gall inducers in the larval stage. *C. siculum* sp. n. differs from the most similar species, such as *C. petryi* (O. Hofmann, 1899) and *C. inflativorella* (Klimesch, 1938), by the peculiar shape of the sacculus and the apically rounded tip of the valva, and in the females by the largely reduced sclerotized antrum.

Description of adult. Holotype, ♂ (Fig. 1). Wingspan 12 mm. Head ochreus, scales on vertex tipped dark brown with basal part ochreus. Labial palpi moderately recurved; second segment with median scales cream, outer surface with brush of short raised cream scales and with scattered brown scales; third segment dark brown mottled with cream scales. Antenna fuscous brown, alternately ringed dark brown and cream below; antennal scape with distal part cream. Thorax cream, prothorax and mesoscutellum apically dark brown. Tegula dark brown, distal part light brown. Forewing rather lanceolate; dark brown, scattered with cream scales, orange-brown spot in subbasal part, two irregular, large and fused spots from dorsal margin to central part of wing, cream costal and tornal spots usually confluent forming fascia or separate by distinct brownish orange spot; fringes ochreus with distinct brown apical cilia. Hindwing light greyish brown, fringes ochreus. Underside of forewing light brown. Underside of hindwing whitish with light brown anterior margin. Foreleg with coxa and femur dark brown, tibia and tarsus dark brown mottled with whitish, with whitish final ring at distal part of each segment; midleg whitish mottled with few brown scales on outer side, tibia and tarsus as foreleg; hindleg with outer side dark brown scattered with whitish, spurs and inner side whitish, dorsal whitish scales of tibia elongated. Abdomen cream.
♀ similar to ♂, body size slightly larger.
♂ genitalia (Figs 2–5). Valva long, slender, weakly curved, rounded at tip; sacculus two-thirds length of valva, broad, with small, pointed tip; vinculum stout, posterior margin undulated, with pair of almost rectangular projections, medial incision slight; saccus long, slender; transtilla with few minute spines; anellus with pair of long sclerotizations; phallus long, slender, moderately S-curved, apically with minute cornuti.
♀ genitalia (Figs 6–9). Eighth segment without process; ventromedial plate with folds, two lateromedial pairs well developed; apophyses posteriores about three times length of apophyses anteriores; antrum broad, short, funnel shaped; ductus bursae with pair of long narrow lateral sclerotizations; signum of medium size with large base and short, strong, moderately curved hook.
Immature stages. Larva (Fig. 10). Length of mature larva 10 mm. Body pale yellow. Head black with 6 pale yellow ocelli. Prothoracic plate well sclerotised, black, with distinct medial sulcus, line of internal margin not homogeneous. Prothorax with light brown spot around the three prespiracular setae. Thoracic legs well devel-

Figs 2–5. *Caryocolum siculum* sp. n., male genitalia. **2**. Holotype, PG 0074 (phallus removed). **3**. Paratype, PG 0083 (phallus removed). **4**. Phallus, enlarged, dorsolateral view, PG 0082. **5**. Phallus, enlarged, lateral view, PG 0083.

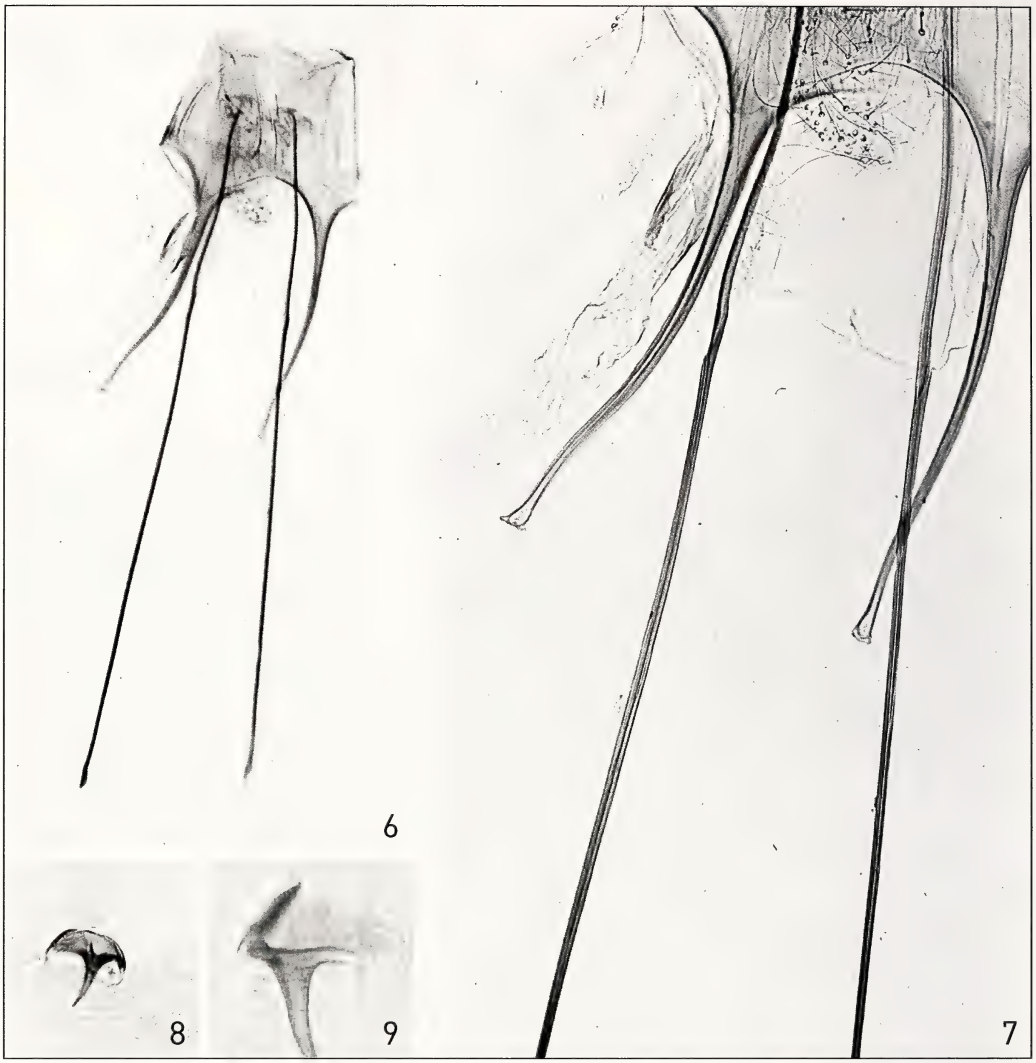
oped; first and second pairs dark brown with inner side pale yellow, third pair light brown with inner side pale yellow. Spiracles of prothoracic and abdominal segment 8 with narrow rounded dark brown area. Prolegs (3–6 and 10 abdominal segments) cylindrical, reduced, with complete crown of small brown crotchets arranged biordinally (on anal prolegs anterior half of crown absent). Anal plate brown.

Pupa (Fig. 11). General characters as reported by Patočka (1989); 6.0–8.5 mm in length; uniformly reddish brown; cremaster dorsally with two triangular projections in lateral position.

Distribution. Central and South-Eastern Sicily (Italy). Iblei Mountains, Province of Catania, Vizzini, Contrada Rubalà, surroundings of Poggio del Vecchio, 320–400 m (UTM VB 7508). Province of Enna, Erei Mountains, Agira, Vallone di Piano della Corte, Contrada Urselluzzo, 500 m (UTM VB 5767).

Etymology. The name *siculum* refers to the island on which the new species was discovered.

Life history. The larva lives and feeds in the stem of the hostplant, causing an internodal gall (Fig. 12 a). The diameter of the *Gypsophila* stems is about 2–3 mm, whereas the stems with the galls are 4–6 mm wide. The length of the internodes varies from 20–50 mm; inside the gall the free space where the larva lives is 15–18 mm. The larva pupates within the feeding-place where it prepares an emergence hole; the pupa is not extruded on emergence. The shape of the hole in section is circular, with a diameter of



Figs 6–9. *Caryocolum siculum* sp. n., female genitalia. **6**. Allotype, PG 0075. **7**. *Idem*, enlarged. **8**. *Idem*, signum, enlarged, dorsal view. **9**. Signum, enlarged, lateral view, PG 0081.

mm. The opening of the hole is free, but using setae and few small fragments of fibre of the stem (only on the outer surface) the larva builds a thin cover near it – with the lateroposterior margin fixed to inside walls of the gall whereas the anterior margin is easily lifted (Fig. 12 b). The larva can be found from April to late June. The possibility to breed larvae at different stages simultaneously allowed making some observations on the biological cycle. Some galls with mature larvae, taken from their natural habitat, were transferred to the laboratory and bred under natural environmental conditions. Biological data were obtained from continuous observations carried out on four mature larvae just before they pupated. Two larvae pupated on 15.vi.2003, both remaining in this stage for 18 days at an average daily temperature of 28°C; the emerging adult females

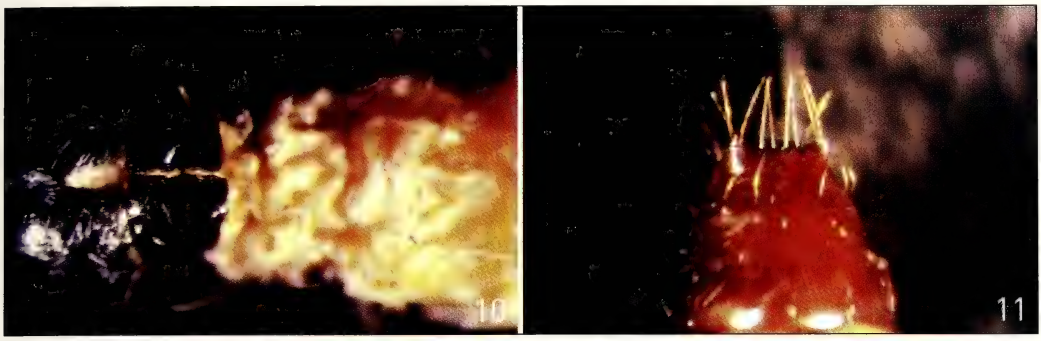


Fig. 10–11. *Caryocolum siculum* sp. n.. **10**. larva: head and prothoracic plate. **11**. pupal cremaster, dorsal view.

Figs 12. *Caryocolum siculum* sp. n., gall. **a**. Stem of *Gypsophila arrostii* with an internodal gall; **b**. Vertical section showing the horizontal cover near the opening.

survived 36 and 30 days respectively at an average daily temperature of 28.5°C. Another larva pupated on 4.vi.2003, remaining in this stage for 18 days, at an average daily temperature of 25.5°C; the resulting adult male survived for 24 days at an average daily temperature of 28°C. The last larva pupated on 22.vi.2003 at an average daily temperature of 28°C and the adult emerged after 16 days. The average daily temperature was calculated over 24 hours; moreover, the days of survival of adults refer to specimens that were not fed. Despite the high number of obtained specimens, no mating and no oviposition were observed in the laboratory despite the presence of host plants. In its habitat the moth rests during the day on the substratum, between leaf-litter and rocks. Because of its mimetic colouration it is very difficult to see; if disturbed, it flies quickly for short distances. After numerous years of nocturnal collecting with mercury-vapour lamps at the type locality no specimen was ever collected. In the laboratory the adults do not seem to be phototropic. This species seems to be univoltine like other species of the genus.

Ecology. *Gypsophila arrostii* is a characteristic species of thermo-xerophilous perennial steppic grasslands of South Italy and Sicily (Fig. 13). It is currently ascribed to the association *Avenulo-Ampelodesmion mauritanici* Minissale where the dominant species is *Ampelodesmos mauritanicus* (Poiret) Dur. et Sch. (Minissale 1995).

A recent floristic study (Turrisi 1999) recorded 406 species of vascular plants for the territory of the Vizzini river valley, but only four Caryophyllaceae: *Silene vulgaris*

Fig. 13. Type locality of *Caryocolum siculum* sp. n. on Sicily, Iblei Mountains, Vizzini, Contrada Rubalà, 320–400 m.

(Moench) Garcke, *S. alba* (Miller) Krause, *S. fuscata* Link and *Gypsophila arrostii* Guss. The latter, dedicated to the Sicilian botanist A. Arrosto, is a suffrutex with an Eastern-Mediterranean distribution that grows on calcareous and sedimentary soils from 0 to 800 m a.s.l.; in Italy it is presently recorded only from four meridional regions: Apulia, Lucania, Calabria, and Sicily (Pignatti 1982).

Remarks. In both collecting sites much human activities affect the conservation of ecosystems. The main problems are pasture, reforestation, and fires. The site near Agira is included in the Nature Reserve of "Vallone di Piano della Corte", whereas for the area of Vizzini the WWF recently requested that the regional authorities protect the territory through the establishment of a new nature reserve.

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Gozmány, L. 2008. Symmocidae. – *In*: R. Gaedike (ed.), Microlepidoptera Palaearctica **13**. – Goecke & Evers, Keltern. 558 pp. – ISBN 978-3-937783-34-5. [in German].

The Hungarian lepidopterist László Gozmány (9.xi.1921 – 15.xii.2006) had already written two volumes for the book series *Microlepidoptera Palaearctica*, i.e. volume 5 on Lecithoceridae (1978) and volume 10 on Holcopogonidae (2000). After many years of work he completed his last volume, treating the Symmocidae. The manuscript was submitted in 1998, but constraints for which he was not responsible caused a long delay until publication. László Gozmány submitted corrections to the manuscript until the end of 2005, but he did not see the publication of the volume as he died in 2006. An obituary to László Gozmány, an honorary member of Societas Europaea Lepidopterologica, was published in *Nota lepidopterologica* 30, 2007: 5–6.

The Symmocidae are in all probability a true Old World group. Despite a few taxa introduced by man to the New World, as well as some that are placed with uncertainty in this family, most species of Symmocidae occur in the dry and arid areas from the Mediterranean via Iran and Afghanistan to Mongolia and southern China. Just 16 species occur outside the Palaearctic region. The group still deserves a lot of research, e.g. records on the life history are available for only less then 10 species. So far as known, larvae are negative phototrophic and feed on detritus or bryophytes. A major problem with Symmocidae is related to species identification, which until now has been very difficult or even impossible. Therefore, the new volume of *Microlepidoptera Palaearctica* is highly welcome.

The book is arranged in the following chapters: (1) preface by the editor, (2) introduction, (3) acknowledgements, (4) general conspectus dealing with morphology, life history, distribution and systematics of Symmocidae, genitalia preparation techniques and a systematic index with page numbers for text and figures to the genera and species treated in the book, (4) the systematic part, (5) distribution of the species, (6) references, (7) list of abbreviations used, (8) list of label data of all specimens figured as adult or genitalia, (9) figures of male genitalia, (9) figures of female genitalia, (10) figures of the adults, (11) abstract, (12) annex listing nomenclatural changes since the submission of the manuscript by the author, and (13) alphabetical index to the taxa treated in the book.

The main part of the volume, the systematic part, comprises 240 pages. It starts with a diagnosis of the Symmocidae, a key to the genera (followed by page numbers) followed by the treatment of the genera. The treatment of each genus starts with a diagnosis, a key to the included species, and species treatments. Each species treatment starts with the reference of the original description, followed by information on type material, relevant literature, diagnostic features, life history (if known), distribution, remarks, and a differential diagnosis. The systematic part is completed with a list of the five genera and 22 species excluded from the Symmocidae. Every species is coupled with an individual code number (1–248) referring to the information given in the subsequent distribution table, the line drawings of the male and female genitalia, as well as the watercolours of the adults, painted by František Gregor (Brno).

The systematic treatment covers 248 species, including the descriptions of seven new genera and 54 new species. Nine genus-group names and 28 species-group names are synonymised, and 40 new generic combinations are provided. Additionally, six species are regarded as incertae sedis due to their untraced type specimens and insufficient original descriptions. Thus, volume 13 of *Microlepidoptera Palaearctica* is more than a comprehensive treatment of the Symmocidae, it is a taxonomic revision that highly updates our knowledge of the group. It enables the user to identify the species, using the identification keys, the informative illustrations and / or the text. A systematic and an alphabetical index guarantee that every taxon can be found quickly. Unfortunately, the German Research Foundation (DFG) provided no financial support for printing the volume, which was the first time in the history of *Microlepidoptera Palaearctica*. As a result, the book is available for 390.00 € (subscription: 348.00 €) per copy. Unfortunately, this price will put it out of reach of most amateurs and many libraries, but everybody who wants to work on Symmocidae will undoubtedly need this book

MATTHIAS NUSS

On the generic affiliation of the taxon *efflexa* Xiao & Li, 2006 (Tineidae)

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Abstract. The taxon *efflexa* Xiao & Li, 2006, described in the genus *Montetinea*, is transferred to the genus *Crypsithyris*, according to close relationships recognised in external characters of the adults and male and female genitalia.

In 2006, Xiao & Li described a new moth species from China, *Montetinea efflexa* (Lepidoptera: Tineidae). However, the illustrations provided for the habitus, male, and female genitalia show very close relationships with members of *Crypsithyris* Meyrick, 1907. Particularly characteristic is the shape of the sclerotizations in the corpus bursae, which is only known from *Crypsithyris*. This character has been previously illustrated for *Crypsithyris* by Xiao & Li (2005). Because of the presence of this character and the absence of contradicting, most parsimonious arguments, the taxon *efflexa* Xiao & Li has to be considered as a member of *Crypsithyris* Meyrick and is transferred herewith to this genus:

Crypsithyris efflexa (Xiao & Li, 2006), comb. nov.

Although Xiao & Li (2006) mention that they describe the female genitalia of *Montetinea* Petersen, 1957 for the first time, this is incorrect. As early as 1962, Parenti described the female genitalia of *Montetinea montana* Petersen, 1957 and provided some important records on the life history of the species. The specimens mentioned by Parenti (1962) were found in a cave with bat guano, which indicates that the larvae might be coprophagous, but not lichenophagous as it has been presumed earlier (Petersen 1957).

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Nota lepidopterologica indices to volumes 1 to 30 by taxon and author names, with publication dates

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The treasurer of the SEL, Robert Trusch, in the name of the Council, asked me to list the new taxa (genera, species) that have been published in the first 30 volumes of *Nota lepidopterologica*. In my opinion it was also important to list other relevant nomenclatorial and taxonomic changes that have been published in the journal.
In the following list in alphabetical order, beside new taxa, the following nomenclatural changes are included: comb. n., stat. n., stat. rev., syn. n., bona sp., sp. rev., nom. n., LT (lectotype designation), and NT (neotype designation).
In some papers the original genus names were not listed and it was impossible for me to find them. The changes proposed in the two papers by von Mentzer (1984, 1989) concerning the names of genera used by Denis & Schiffermüller, were not listed (see: Sattler, 1989).
Following the index of taxa all papers published in the first 30 volumes of *Nota* are listed in alphabetical order of first author name, and finally the exact dates of publication for each issue of the journal are listed.
Altogether, 782 scientific papers were published. They contain the descriptions of one new family, one new subfamily, one new tribe, 23 new genera, two new subgenera, 321 new species, and 36 new subspecies. They also contain 240 new synonymies, 178 new combinations, 66 changes of status, 25 new names, one nomen protectum, and 118 lectotype and 19 neotype designations. Infrasubspecific taxa were not considered. Additionally, 37 obituaries and biographies/bibliographies have been published.

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bivittata South, 1900 (ssp. of *Emydia cribrum*), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 231

blanchieri Fruhstorfer, 1908 (ssp. of *Satyrus semele*), **syn. n.**; now: *Hipparchia senthes* (Fruhstorfer, 1908) – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 204

blanchieroides Stauder, 1921 (f. of *Satyrus semele*), **LT** – Olivier & Coutsis 1997 (10. xii.) **20** (3/4): 231

blandana Eversmann, 1844 (*Tortrix*), **LT**; now: *Cochylimorpha* – Nedoshivina 2007 (15.v.) **30** (1): 96

boeklini **sp. n.** (*Idaea*) – Mentzer 1990 (31.i.) **12 (1989)** (4): 300

boeklini Mentzer, 1990 (*Idaea*), **syn. n.** of *Idaea camparia* (Herrich-Schäffer, 1852) – Raineri 1992 (31.xii.) **15** (2): 152

bouhedmae **sp. n.** (*Episcythris*) – Passerin d'Entrèves 1991 (31.v.) **14** (1): 65

boulifa Dumont, 1922 (*Euproctis*) **LT**; **syn. n.** of *Euproctis chrysophaea* (Walker, 1865) – Freina & Witt 1984 (31.xii.) **7** (4): 326, 329

boursini Rungs, 1967 (ssp. of *Stilbia calberlae*), **comb. n.**; now: *Stilbia andalusiaca boursini* – Dufay 1985 (30.vi.) **8** (2): 172

bracatana Rebel, 1894 (*Pandemis*), **comb. n.**; now: *Choristoneura* – Razowski 1979 (17.viii.) **2** (1/2): 58

brachypterella **sp. n.** (*Biselachista*) – Klimesch 1990 (30.ix.) **13** (2/3): 138

brevis **sp. n.** (*Acalyptris*) – Puplesis 1990 (31.iii.) **13** (1): 86

brontophora Meyrick, 1885 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

brunea Griveaud, 1973 (*Porthesaroa*), **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

brunella **sp. n.** (*Eumasia*) – Hättenschwiler 1998 (1.xii.) **21** (4): 266

bruzzanaria Costa, 1863 (*Geometra*), **syn. n.** of *Zethes insularis* Rambur, 1833 – Raineri 1986 (31.xii.) **9** (3/4): 234

bundeli Solyanikov, 1995 (*Fumea*), **comb. n.**; now: *Psyche* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265

bureschi Karnoschitzky, 1954 (ssp. of *Ascotis selenaria*), **syn. n.** of *Ascotis selenaria selenaria* ([Denis & Schiffermüller], 1775) – Ganev 1988 (31.viii.) **11** (2): 99

buszkoi **sp. n.** (*Scythris*) – Baran 2004 (31.i.) **26 (2003)** (3/4): 90

buvati Traugott-Olsen, 1994 (*Biselachista*), **syn. n.** of *Elachista occidentalis* Frey, 1882 – Kaila & Varalda 2004 (23.xii.) **27** (2/3): 226

buxeus **sp. n.** (*Brachodes*) – Kallies 2001 (10.viii.) **24** (1/2): 14

caerulea Hudson, 1925 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

cahama **ssp. n.** (of *Eriogaster rimicola*) – Zolotuhin, 2007 (15.v.) **30** (1): 48

calandrella **sp. n.** (*Coleophora*) – Baldizzone 1982 (30.vi.) **5** (2/3): 73

calaspidea Clarke, 1934 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

calvicaput Walsingham, 1900 (*Epagoge*), **comb. n.**; now: *Minutargyrotoza* – Yasuda & Razowski 1991 (30.ix.) **14** (2): 189

canariella **sp. n.** (*Ischnophanes*) – Baldizzone 1984 (30.vi.) **7** (2): 101

canetella Caradja, 1920 (*Scythris*), **LT**; Now: *Scythris ventosella* Chrétien, 1907 – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 142

Capidentalia Park, 1995 (Gelechiidae), **syn. n.** of *Bagdadia* Amsel, 1949 – Sattler 1999 (1.xii.) **22** (4): 235

caradjae Rebel, 1902 (*Atychia*), **comb. n.**; now: *Titanio* – Nuss & Kallies 2001 (21.xii.) **24** (3): 36

catharodactylus Caradja, 1921 (var. of *Pterophorus lienigianus*), **LT**; **comb. n.**; **stat. rev.**; now: *Leioptilus* – Gibeaux 1988 (31.x.) **11** (3): 187

caucasella **sp. n.** (*Acompsia* (*Acompsia*)) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 124

caucasica **ssp. n.** (of *Polyploca flavicornis*) – Alberti, B. & K. Fritsch. 1983 (31.xii.) **6** (4): 200

caucasica Solyanikov, 1991 (*Fumea*), **comb. n.**; now: *Bruandia* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265

caucasiella **sp. n.** (*Agonopterix*) – Karsholt et al. 2006 (17.ii.) **28 (2005)** (3/4): 180

celeris Omelko, 1988 (*Gibbosa*), **syn. n.** of *Stenolechia notomochla* Meyrick, 1935 – Park 1994 (31.iii.) **16 (1993)** (3/4): 287

centaureae Deschka, 1973 (*Bucculatrix*), **syn. n.** of *Bucculatrix infans* Staudinger, 1880 – Mey 1999 (1.ix.) **22** (3): 218

ceramus **ssp. n.** (of *Tosirips perpulchranus*) – Razowski 1987 (31.iii.) **10** (1): 91

ceres **sp. n.** (*Oegoconia*) – Sutter 2007 (15.v.) **30** (1): 194

certhiella **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 215

cervana Eversmann, 1844 (*Paedisca*), **LT**; now: *Epiblema costipunctana* (Haworth, 1811) – Nedoshivina 2007 (15.v.) **30** (1): 98

chamomillana Herrich-Schäffer, 1851 (*Cochylis*), **syn. n.** of *Stenodes decolorella* (Zeller, 1839) – Sattler 1986 (31.xii.) **9** (3/4): 257

charmetanti Vuillot, 1890 (*Artaxa*), **syn. n.** of *Euproctis chrysophaea* (Walker, 1865) – Freina & Witt 1984 (31.xii.) **7** (4): 329

chasanica **sp. n.** (*Phaulernis*) – Gaedike 1993 (30.xi.) **16** (2): 95

chekiangella **sp. n.** (*Paramartyria*) – Kaltenbach & Speidel 1982 (31.iii.) **5** (1): 32

cheradias Meyrick, 1909 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

chinensis Daniel, 1954 (ssp. of *Lithosia griseola*), **LT**; now: *Eilema* (*Collina*) *chinensis* – Ignatyev & Witt 2007 (15.v.) **30** (1): 33

chinensis **sp. n.** (*Proutia*) – Hättenschwiler & Chung-Ling 1990 (31.i.) **12 (1989)** (4): 262

chinensis **ssp. n.** (of *Sephisa dichroa*) – Nguyen 1984 (31.xii.) **7** (4): 341

chlorista Meyrick, 1912 (*Nemotois*), **syn. n.** of *Nemotois istrianellus* (Heydenreich, 1851) – Kozlov 2004 (31.i.) **26 (2003)** (3/4): 120

chpakovskyi Chnéour, 1956 (*Lasiocampa*), **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96

Christophia **subgen. n.** of *Victrix* Staudinger, 1879 (Noctuidae) – Varga & Ronkay 1989 (30.iv.) **12** (1): 69

christenseni **sp. n.** (*Lathronympha*) – Aarvik & Karsholt 1993 (30.iv.) **15 (1992)** (3/4): 176

christenseni **sp. n.** (*Melasina*) – Hättenschwiler 1990 (31.i.) **12 (1989)** (4): 258

chrysocephala Hübner, 1804 (*Bombyx*), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 231

chrysophaea Walker, 1865 (*Orgyia*) **LT**; now: *Euproctis* – Freina & Witt 1984 (31.xii.) **7** (4): 326

cinderella **sp. n.** (*Depressaria*) – Corley 2002 (1.iii.) **24 (2001)** (4): 29

cinerea Toll, 1953 (*Coleophora*) **syn. n.** of *Coleophora virgaureae* Staudinger, 1857 – Baldizzone 1981 (30.ix.) **4** (3): 64

cinereipalpana Razowski, 1958 (*Cnephasia*), **syn. n.** of *Cnephasia stephensiana stolidana* (Walker) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

citrinaria Gaede, 1930 (*Zaranga*), **syn. n.** of *Zaranga pannosa* Moore, 1884 – Schintlmeister 1989 (30.xi.) **12** (3): 206

clasperella **sp. n.** (*Sefidia*) – Asselbergs 1994 (31.iii.) **16 (1993)** (3/4): 172

clathrella Toll, 1953 (*Coleophora*) **syn. n.** of *Coleophora struella* Staudinger, 1859 – Baldizzone 1981 (30.ix.) **4** (3): 64

claudiae Kristal & Hirneisen, **sp. n.** (*Pharmacis*) – Kristal et al. 1994 (30.xi.) **17** (1/2): 56

claviformis Park, 1993 (*Hypatima*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

coelatalis Walker, 1859 (*Dosara*), **comb. n.**; now: *Achyra* – Maes 1987 (31.x.) **10** (3): 177

cognata Moore, 1885 (*Hypena*), **comb. n.**; Now: *Dichromia* – Lödl 1994 (31.iii.) **16 (1993)** (3/4): 242

composita **sp. n.** (*Auchmis*) – Plante 1986 (31.iii.) **9** (1/2): 94

compsias Walsingham, 1907, (*Scythris*), **LT**; – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 157

conankinensis (*Stenodes*), **comb. n.**; now: *Cochylimorpha* – Razowski 2006 (14.viii.) **29** (1/2): 123

conchylidella Snellen, 1884 (*Lampros*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 217

congener Roepke, 1945 (*Saronaga*), **comb. n.**; **stat. n.**; now: ssp. of *Tethea consimilis* – Yoshimoto 1989 (30.xi.) **12** (3): 229

constantella Dumont, 1925 (*Scythris*), **LT**; now: *Scythris tenuivittella* (Stainton, 1867) – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 151

constantina **sp. n.** (*Myinodes*) – Hausmann 1994 (30.xi.) **17** (1/2): 37

continentalis Tshisitjakov, 1985 (ssp. of *fusiformis* Matsumura, 1921), **syn. n.** of *Pheosia rimosa* Packard, 1864 – Schintlmeister et al. 1987 (30.vi.) **10** (2): 98

contraria Philpott, 1930 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

coreana Matsumura, 1922 (*Quadricalcarifera*), **syn. n.** of *Somera pryeri* Leech, 1889 – Schintlmeister 1989 (30.xi.) **12** (3): 206

coreana Nakatomi, 1977 (ssp. of *Dudusa sphingiformis*), **syn. n.** of *Dudusa sphingiformis* Moore, 1877 – Schintlmeister 1989 (30.xi.) **12** (3): 206

corporea Corti, 1932 (*Euxoa*), **bona sp.** – Plante 1983 (30.vi.) **6** (2/3): 127

corsa **sp. n.** (*Scythris*) – Passerin d'Entrèves 1986 (31.xii.) **9** (3/4): 216

corsicola Corti, 1928 (ssp. of *Euxoa obelisca*), **comb. n.**; **bona sp.**; now: *Euxoa* – Dufay 1984 (30.vi.) **7** (2): 113

costimaculella **sp. n.** (*Recurvaria*) – Huemer & Karsholt 2001 (21.xii.) **24** (3): 42

crassifasciana Joannis, 1920 (*Cnephasia*), **syn. n.** of *Cnephasia pasiuana* (Hübner, 1796) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

crassipuncta Christoph, 1893 (ssp. of *Lycaena anteros*), **LT**; **stat. n.**; now: *Aricia* (*Ultraaricia*) – Nekrutenko 1980 (1.vi.) **3** (1/2): 59

cuencella Rebel, 1901, (*Scythris* (*Butalis*)), **LT**; now: *Scythris grandipennis* (Haworth, 1828) – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 143

cuprariella Lienig & Zeller, 1847, **stat. rev.** (*Coleophora*) – Stübner 2007 (15.v.) **30** (1): 144

curvifascia Rothschild, Hartert & Jordan, 1917 (ssp. of *Metanastria diagramma*), **stat. n.**; **syn. n.** of *Macrothylacia diagramma alphacaria* – Freina & Witt 1984 (31.iii.) **7** (1): 31

curvicosta Warren, 1915 (*Polyploca*), **comb. n.**; now: *Takapsestis* – Yoshimoto 1990 (31.xii.) **13** (4): 241

cuspidata (*Stenodes*), **comb. n.**; now: *Cochylimorpha* – Razowski 2006 (14.viii.) **29** (1/2): 123

cylindrata **sp. n.** (*Gnorismoneura*) – Wang et al. 2004 (28.vi.) **27** (1): 82

cymoptila Meyrick, 1929 (*Chelaria*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

cypriensis **sp. n.** (*Micropterix*) – Heath 1985 (31.xii.): **8** (4): 338

cyri Nekrutenko, 1978 (ssp. of *Pseudothecla ledereri*), **comb. n.**; now: ssp. of *Armenia hyrcanica* – Weidenhoffer & Eckweiler 1988 (31.i.) **10 (1987)** (4): 244

Dactyloceratinae subfam. n. (Brahmeidae) – Sauter 1986 (31.xii.) **9** (3/4): 268
daddi Heinrich, 1923 (*Lasiocampa*), **syn. n.** of *Lasiocampa trifolii trifolii* – Freina & Witt 1983 (30.vi.) **6** (2/3): 95
daedalea **sp. n.** (*Cnephasia*) – Razowski 1983 (31.xii.) **6** (4): 236
dagmaris **sp. n.** (*Scrobipalpa*) – Povolný 1987 (31.iii.) **10** (1): 80
dahurica **sp. n.** (*Metanarsia*) – Bidzilya 2005 (7.vi.) **27 (2004)** (4): 285
dalmaticola (ssp. of *Lycaena idas*), **nom. n.** pro *Lycaena ismenias violaceus* Rangnow, 1935, nec *Lycaena meleager dalmatina* Wagner, 1909 – Koçak 1980 (31.v.) **2 (1979)** (4): 141
dama Staudinger, 1892 (*Lycaena*) **LT**; now: *Polyommatus* (*Agrodiaetus*) – Olivier et al. 1999 (1.ix.) **22** (3): 202
dammersi Busck, 1934 (*Plutella*), **comb. n.**; now: *Eudophasia* – Kyrki 1990 (31.iii.) **13** (1): 35
danieli Wiltshire, 1966 (*Scopula*), **comb. n.**; **stat. n.**; now: ssp. of *Scopuloides origalis* – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 202
Danilevskia Kuznetsov, 1970 (Tortricidae), **syn. n.** of *Cydia* Hübner, 1825 – Razowski 1992 (31.iii.) **14 (1991)** (4): 320
dantchenkoi Lukhtanov & Wiemers, **sp. n.** (*Agrodiaetus*) – Lukhtanov et al. 2003 (30.x.) **26** (1/2): 66
datesis Diakonoff (*Phalonidia*?), **comb. n.**; now: *Piercea* Filipjev, 1940 – Razowski 1992 (31.iii.) **14 (1991)** (4): 325
datini Mabille, 1888 (ssp. of *Bombyx decolorata*), **syn. n.** of *Lasiocampa decolorata decolorata* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96
decolorella Zeller, 1839 (*Anarsia*), **comb. n.**; now: *Stenodes* – Sattler 1986 (31.xii.) **9** (3/4): 256
definita Meyrick, 1935 (Phalonia), **comb. n.**; now: *Piercea* Filipjev, 1940 – Razowski 1992 (31.iii.) **14 (1991)** (4): 325
defoliella Constant, 1895 (*Talaeporia* [sic]), **comb. rev.**; now: *Taleporia* – Hättenschwiler & Scalercio 2003 (30.x.) **26** (1/2): 21
deliana Gaede, 1933 (*Pseudofentonia*), **syn. n.** of *Formotensha marginalis* Matsumura, 1925 – Schintlmeister 1989 (30.xi.) **12** (3): 206
dellabrunai **sp. n.** (*Standfussia*) – Hättenschwiler 1985 (31.iii.) **8** (1): 25
dentosella Herrich-Schäffer, 1854 (*Calotrypis*), **syn. n.** of *Epermenia* (*Calotripis*) *insecurella* (Stainton, 1849) – Gaedike 1993 (30.iv.) **15 (1992)** (3/4): 231
dentosella Stainton, 1851 (*Elachista*), **syn. n.** of *Epermenia* (*Calotripis*) *insecurella* (Stainton, 1849) – Gaedike 1993 (30.iv.) **15 (1992)** (3/4): 231
derrai **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 205
desinens **sp. n.** (*Tomares*) – Nekrutenko & Effendi 1980 (1.vi.) **3** (1/2): 69
destituta **sp. n.** (*Aethes*) – Razowski 1983 (31.xii.) **6** (4): 242
detruncatum Zagulajev & Blumental, 1994 (*Agdistis*), **syn. n.** of *Agdistis gerasimovi* Zagulajev & Blumental, 1994 – Ustjuzhanin 2001 (21.xii.) **24** (3): 23
diabolica **sp. n.** (*Melanchra*) – Plante 1990 (31.xii.) **13** (4): 215
diacona Lederer, 1858 (*Atychia*), **syn. n.** of *Brachodes candefactus* (Lederer, 1858) – Kallies 2001 (10.viii.) **24** (1/2): 11

Dicanticinta **gen. n.** (Tortricidae) – Yasuda & Razowski 1991 (30.ix.) **14** (2): 180

diehli Werny, 1966 (ssp. of *Tethea consimilis*), **syn. n.** of *Tethea consimilis congener* (Roepke, 1945) – Yoshimoto 1989 (30.xi.) **12** (3): 229

digna **sp. n.** (*Eilema* (*Collina*)) – Ignatyev & Witt, 2007 (15.v.) **30** (1): 39

dimorpha Petry, 1904 (*Acompsia*), **LT**; now: *Acompsia* (*Acompsia*) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 120

Diploschizia Heppner, 1981 (Glyphipterigidae), **syn. n.** of *Glyphipterix* – Kyrki 1990 (31.iii.) **13** (1): 37

dirempta Staudinger, 1859 (*Agrotis*), **syn. n.** of *Agrotis lata* Treitschke, 1835 – Zilli 1992 (31.v.) **15** (1): 74

discessa Walker, 1861 (*Chlorissa*), **comb. n.**; now: *Phaiogramma* – Hausmann 1996 (21.xi.) **19** (1/2): 53

discopunctana Eversmann, 1844 (*Cochylis*), **LT**; now: *Cochylimorpha* – Nedoshivina 2007 (15.v.) **30** (1): 100

disforma **sp. n.** (*Cnephasia*) – Razowski 1983 (31.xii.) **6** (4): 237

dissimilis Warren & Rothschild, 1905 (*Euchloris*), **syn. n.** of *Acidaliastis micra* Hampson, 1896 – Hausmann 1996 (21.xi.) **19** (1/2): 58

dissona Puplesis, 1984 (*Astigmella*), **syn. n.** of *Stigmella naturnella* (Klimesch, 1936) – Nieukerken et al. 2004 (23.xii.) **27** (2/3): 133

diticinctana Walsingham, 1900 (*Tortrix*), **comb. n.**; now: *Dicanticinta* – Yasuda & Razowski 1991 (30.ix.) **14** (2): 181

diversicilia Filipjev, 1931 (*Platyptilia*), **syn. n.** of *Buszkoiana capnodactylus* (Zeller, 1841) – Ustjuzhanin 2001 (21.xii.) **24** (3): 25

dividua Philpott, 1921 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

dombaiensis Alberti, 1969 (ssp. of *Lycaena anteros*), **comb. n.**; now: ssp. of *Aricia* (*Ultraaricia*) *anteros* – Nekrutenko 1980 (1.vi.) **3** (1/2): 58

domogledana **sp. n.** (*Eupithecia*) – Vojnits & Szabó 1988 (31.viii.) **11** (2): 160

Dosara Walker, 1859 (*Pyralidae*), **syn. n.** of *Achyra* Guenée, 1849 – Maes 1987 (31.x.) **10** (3): 177

Douzdrina de Laever, 1985, **syn. n.** of *Spodoptera* Guenée, 1852 – de Bros 1985 (31.xii.) **8** (4): 385

Douzdrina **gen. n.** (Noctuidae) – de Laever 1985 (30.vi.) **8** (2): 148

douzina de Laever, 1985, **syn. n.** of *Paradrina clavipalpis* – de Bros 1985 (31.xii.) **8** (4): 386

douzina **sp. n.** (*Paradrina*) – de Laever 1985 (30.vi.) **8** (2): 146

drahomirae Povolný, 1966 (*Scrobipalpa*), **syn. n.** of *Scrobipalpa vasconiella* (Rössler, 1877) – Povolný 1987 (31.iii.) **10** (1): 82

dubatolovi **sp. n.** (*Stenoptilia*) – Ustjuzhanin 2001 (21.xii.) **24** (3): 15

duelduelica Osthelder, 1932 (ssp. of *Bryophila tabora*), **stat. n.**; now: *Victrix* (*Rasihia*) – Varga & Ronkay 1991 (30.ix.) **14** (2): 164

duercki Zerny, 1935 (*Celama*), **LT**; **comb. n.**; now: *Nola duercki duercki* – Freina & Witt 1984 (30.vi.) **7** (2): 138

***dujardini* sp. n.** (*Gelechia*) – Huemer 1991 (30.ix.) **14** (2): 127

durandi Lucas, 1926 (*Orgyia*), **syn. n.** of *Euproctis chrysophaea* (Walker, 1865) – Freina & Witt 1984 (31.xii.) **7** (4): 329

dushanbella Lvovsky & Arutjunova, 1992 (*Callima*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 217

***eberti* nom. n.** pro *Melitaea hafiz pfeifferi* Gross & Ebert, 1975, nec *Melitaea didyma pfeifferi* Bryk, 1940 – Koçak 1980 (31.v.) **2 (1979)** (4): 141

***ebertorum* nom. n.** pro *Agrotis maraschi* Draudt, 1933, nec *Agrotis terminicincta maraschi* Draudt, 1933 – Koçak 1980 (31.v.) **2 (1979)** (4): 144

***ecballiella* sp. n.** (*Phtheochroa*) – Huemer 1990 (31.i.) **12 (1989)** (4): 273

***egidijui* sp. n.** (*Acalyptris*) – Puplesis 1990 (31.iii.) **13** (1): 87

***eichleri* sp. n.** (*Aethes*) – Razowski 1983 (31.xii.) **6** (4): 239

***elbursicum* sp. n.** (*Gnorimoschema*) – Povolný 1984 (30.ix.) **7** (3): 264

***elevatella* sp. n.** (*Cauchas*) – Kozlov 1993 (30.xi.) **16** (2): 121

***elksourensis* sp. n.** (*Elachista*) – Kaila 2005 (12.viii.) **28** (2): 154

elongata Rothschild, 1914 (ssp. of *Diacrisia biagi*), **LT**; now: ssp. of *Spilosoma biagi* – Thomas 1990 (30.ix.) **13** (2/3): 183

***elpidia* sp. n.** (*Aethes*) – Razowski 1983 (31.xii.) **6** (4): 239

emargana blackmorei Obraztsov, 1963 (*Acleris*), **syn. n.** of *Acleris effractana* (Hübner, 1799) – Karsholt et al. 2005 (12.viii.) **28** (2): 94

Empista Povolný, 1968 (Gelechiidae), **stat. n.**; now subgenus of *Kiwaia* – Sattler 1988 (31.i.) **10 (1987)** (4): 234

endymion endymion Freyer, 1850 (*Papilio*), **NT**; now: *Turanana* – Coutsis 2005 (7.vi.) **27 (2004)** (4): 256

***endymionoides* ssp. n.** (of *Turanana taygetica*) – Coutsis 2005 (7.vi.) **27 (2004)** (4): 269

epischista Meyrick, 1936 (*Thermocrates*), **comb. n.**; now: *Dryadaula* – Robinson 1988 (30.iv.) **11** (1): 75

Episcioptera Hartig, 1936 (Psychidae), **syn. n.** of *Leptapterix* Hübner, 1827 – Hättenschwiler 1984 (30.vi.) **7** (2): 145

erastrialis Walker, 1866 (*Hypena*), **comb. n.**; now: *Dichromia* – Lödl 1994 (31.iii.) **16 (1993)** (3/4): 242

***eremia* sp. n.** (*Protopterna*) – Yasuda & Razowski 1991 (30.ix.) **14** (2): 185

***erewani*, ssp. n.** (of *Oligia latruncula*) – Fazekas 1984 (30.vi.) **7** (2): 118

erminea Walsingham, 1907 (*Scythris*), **LT**; **syn. n.** of *Scythris tessulatella* Rebel, 1903 Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 150

***etolia* ssp. n.** of *Ochropleura gracilis* – Dufay 1983 (31.iii.) **6** (1): 47

***etrusca* sp. n.** (*Coleophora*) – Baldizzone 1990 (31.xii.) **13** (4): 198

eucalla Li & Zheng, 1998 (*Capidentalia*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

***Euclidiana* gen. n.** (Noctuidae) – Rákosy 1985 (31.xii.): **8** (4): 368

Eucosmodes Kuznetsov, 1973 (Tortricidae), **syn. n.** of *Hendecaneura* Walsingham, 1900 – Razowski 1989 (31.i.) **11 (1988)** (4): 289

Eumachaeristis Meyrick, 1938 (Plutellidae), **syn. n.** of *Rhigognostis* Zeller, 1857 – Kyrki 1990 (31.iii.) **13** (1): 37

***eurasiatica* sp. n.** (*Coleophora*) – Baldizzone 1989 (30.iv.) **12** (1): 13

eurata Prout, 1913 (*Glossostrophia*), **comb. n.**; now: *Pseudocinglis* – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 206

europaea Wehrli, 1934 (ssp. of *Ptychopoda camparia*), **syn. n.** of *Idaea camparia* (Herrich-Schäffer, 1852) – Mentzer 1990 (31.i.) **12 (1989)** (4): 301

euryaula Meyrick, 1925 (*Coleophora*), **LT** – J.-F. Landry & Baldizzone 1993 (30.xi.) **16** (2): 127

eurybathra Meyrick, 1931 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

exaridanus Kuznetsov **sp. n.** (*Olethreutes*) – Kuznetsov & Mikkola 1991 (31.xii.) **14** (3): 202

externa Eversmann, 1844 (*Paedisca*), **LT**; now: *Argyroploce* – Nedoshivina 2007 (15.v.) **30** (1): 100

externana Eversmann, 1844 (*Tortrix*), **LT**; now: *Ceratoxanthis* – Nedoshivina 2007 (15.v.) **30** (1): 102

***fabiani* sp. n.** (*Victrix* (*Poliobrya*)) – Varga & Ronkay 1989 (30.iv.) **12** (1): 78

falciformis Haworth, 1828 (*Recurvaria*), **stat. n.**; now: *Epermenia* – Scholz 1996 (13.v.) **18 (1995)** (3/4): 291

***falkneri* nom. n.** pro *Psyche quadrangularis albescens* Staudinger, 1900, nec *Psyche pyrenaella albescens* Oberthür, 1883 – Koçak 1980 (31.v.) **2 (1979)** (4): 143

fallax Staudinger, 1900 (*Atychia*), **LT**; now: *Brachodes* – Kallies 1998 (15.x.) **21** (3): 176

***fascinata* sp. n.** (*Takapsestis*) – Yoshimoto 1990 (31.xii.) **13** (4): 236

***faunieralis* sp. n.** (*Syrianarpia*) – Gianti 2005 (7.vi.) **27 (2004)** (4): 300

faustinata Millière, 1868 (*Nemoria*), **comb. n.**; now: *Phaiogramma* – Hausmann 1996 (21.xi.) **19** (1/2): 52

ferrealis Hampson, 1900 (*Stenia*), **comb. n.**; **LT**; now: *Pyrausta* – Maes 2002 (1.iii.) **24 (2001)** (4): 55

fervida Walker, 1863 (*Euproctis*), **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

***fibigerella* sp. n.** (*Euzophera*) – Asselbergs 1997 (10.xii.) **20** (3/4): 306

***fibigeri* sp. n**. (*Acompsia* (*Acompsia*)) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 130

***fibigeri* sp. n.** (*Agrochola*) – Hacker & Moberg 1989 (30.vi.) **12** (2): 130

***fibigeri* sp. n.** (*Bembecia*) – Z. Laštůvka & A. Laštůvka 1994 (31.iii.) **16 (1993)** (3/4): 234

***filistigma* sp. n.** (*Hyponephele*) – Pagès 2007 (15.xi.) **30** (2): 358

***flavifasciaria* sp. n.** (*Clepsis*) – Wang et al. 2003 (30.x.) **26** (1/2): 51

formosa Puplesis & Seksjaeva, **sp. n.** (*Bucculatrix*) – Puplesis ; Seksaeva & Puplesiene 1992 (31.v.) **15** (1): 42

formosana Frölich, 1830 (*Tortrix*), **auct. rev.**; now *Lozotaeniodes* – Speidel & Aarvik 2002 (1.viii.) **25** (1): 19

freyi Staudinger, 1870 (*Elachista*), **syn. rev.** of *Elachista juliensis* Frey, 1870 – Kaila & Varalda 2004 (23.xii.) **27** (2/3): 220

friedrichi Viidalepp & Skou, **sp. n.** (*Xanthorhoe*) – Viidalepp & Hausmann 2004 (31.i.) **26 (2003)** (3/4): 107

fritschi **sp. n.** (*Phalacropterix*) – Hättenschwiler 2003 (30.x.) **26** (1/2): 11

fucata Püngeler, 1909 (*Acidalia*), **comb. n.**; now: *Scopuloides* – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 198

fuligana [Denis & Schiffermüller], 1775 (*Tortrix*), **NT**; now: *Pristerognatha* – Aarvik 1986 (31.xii.) **9** (3/4): 156

fulva Turati, 1924 (*Agrotis*), **syn. n.** of *Agrotis lata* Treitschke, 1835 – Zilli 1992 (31. v.) **15** (1): 74

fulvana Stephens, 1834 (*Carpocapsa*), **LT**; **sp. rev.**; now: *Eucosma* – Agassiz & Langmaid 2004 (28.vi.) **27** (1): 46

funerea Eversmann, 1847 (ab. of *striata*), **comb. n.**; **stat. n.**; now ssp. of *Spiris striata* – Freina & Witt 1984 (30.ix.) **7** (3): 229

gaedikei **sp. n.** (*Infurcitinea*) – Baldizzone 1984 (30.ix.) **7** (3): 193

galaica Palanca Soler et al. 1982 (*Thaumetopoea*), **comb. n.**; **syn. n.** of *Traumatocampa pityocampa pityocampa* ([Denis & Schiffermüller], 1775) – Freina & Witt 1985 (30.vi.) **8** (2): 183

galega Agenjo, [1977] (ssp. of *Coscinia cribraria*), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 232

gallagenellum **sp. n.** (*Caryocolum*) – Huemer 1989 (30.iv.) **12** (1): 22

gallica Huemer, 1992 (*Teleiodes*), **syn. n.** of *Teleiodes italica* Huemer, 1992 – Huemer & Karsholt 2001 (21.xii.) **24** (3): 45

galloi sp. n. (*Agrodiaetus*) – Baletto & Toso 1979 (17.viii.) **2** (1/2): 14

gerasimovi Lvovsky, 1982 (*Borkhausenia*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 217

gerassimovi Koshantschikov, 1923 (*Stygia*), **LT**; **syn. n.** of *Brachodes appendiculata* Esper, 1783 – Yakovlev 2006 (17.ii.) **28 (2005)** (3/4): 160

gerennae **ssp. n.** (of *Entephria cyanata*) – Gyulai 1984 (30.ix.) **7** (3): 251

ghilarovi Solyanikov, 1991 (*Fumea*), **comb. n.**; now: *Psyche* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265

Gibbosa Omelko, 1988 (Gelechiidae), **syn. n.** of *Stenolechia* Meyrick, 1894 – Park 1994 (31.iii.) **16 (1993)** (3/4): 287

gielisi **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 206

gil **sp. n.** (*Amata*) – Witt et al. 2007 (15.xi.) **30** (2): 368

gilvana Eversmann, 1844 (*Tortrix*), **LT**; now: *Choristoneura diversana* (Hübner, 1817) – Nedoshivina 2007 (15.v.) **30** (1): 102

giuditta Schawerda, 1934 (*Ephesia*), **syn. n.** of *Catocala mariana* Rambur, 1858 – Dufay 1985 (30.vi.) **8** (2): 173

glabrata Meyrick, 1922 (*Nemotois*), **syn. n.** of *Nemotois mollella* (Hübner, 1813) – Kozlov 2004 (31.i.) **26 (2003)** (3/4): 123

glareolella **sp. n.** (*Coleophora*) – Baldizzone 1989 (30.vi.) **12** (2): 118

glaucoterma Meyrick, 1911 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

gnomia Ponomarenko, 1995 (*Capidentalia*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

gobica Lvovsky & Piskunov, 1989 (*Metanarsia*), **syn. n.** of *Metanarsia alphitodes* (Meyrick, 1891) – Bidzilya 2005 (7.i.) **27 (2004)** (4): 291

golestanensis **sp. n.** (*Gortyna*) – Fibiger & Zahiri 2007 (19.i.) **29 (2006)** (3/4): 215

gozmanyi **sp. n.** (*Episema*) – Ronkay & Hacker 1985 (31.iii.) **8** (1): 70

gozmanyi **sp. n.** (*Scythris*) – Passerin d'Entrèves 1986 (31.xii.) **9** (3/4): 217

gracilariella Busck, 1904 (*Zelleria*), **comb. n.**; now: *Euhyponomeutoides* – Kyrki 1990 (31.iii.) **13** (1): 35

gracilensis (*Stenodes*), **comb. n.**; now: *Cochylimorpha* – Razowski 2006 (14.viii.) **29** (1/2): 123

gracilis F. Wagner, 1929 (*Ochropleura*) (ssp. of *Agrotis celsicola*), **bona sp.**; now: *Ochropleura* – Dufay 1983 (31.iii.) **6** (1): 41

gracilis Wagner, 1929 (*Ochropleura*), **LT**; – Dufay 1983 (30.vi.) **6** (2/3): 84

gracilis Wagner, 1931 (*Amelina*), **stat. rev.**; now: *Victrix* – Varga & Ronkay 1989 (30.iv.) **12** (1): 76

Graellsia Grote, 1896 (Saturniidae), **syn. n.** of *Actias* Leach, 1815 – Nässig 1991 (30.ix.) **14** (2): 136

grammiptera Rambur, 1839 (*Agrotis*), **syn. n.** of *Chersotis elegans* (Eversmann, 1837) – Dufay 1986 (31.iii.) **9** (1/2): 51

grandipennis Haworth, 1828 (*Porrectaria*), **LT**; now: *Scythris* – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 143

grandiprocessa **sp. n.** (*Gnorismoneura*) – Wang et al. 2004 (28.vi.) **27** (1): 81

graphitana Eversmann, 1844 (*Tortrix*), **LT**; now: *Capricornia boisduvaliana* (Duponchel, 1836) – Nedoshivina 2007 (15.v.) **30** (1): 104

gredosella **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 209

grisea Butler, 1885 (*Microphalera*), **comb. n.**; now: *Ptilodon* Hübner, 1822 – Schintlmeister et al. 1987 (30.vi.) **10** (2): 99

griseanova Rezbanyai-Reser, 1987 (*Idaea*), **syn. n.** of *Idaea predotaria* Hartig, 1951 – Raineri 1989 (30.xi.) **12** (3): 187

griseata Warren, 1915 (*Polyploca*), **comb. n.**; now: *Takapsestis* – Yoshimoto 1990 (31.xii.) **13** (4): 239

grisescens Roepke, 1944 (*Neogaurena*), **syn. n.** of *Palimpsestis semiobsoleta* Warren, 1915 – Yoshimoto 1990 (31.xii.) **13** (4): 239

grossi **nom. n.** pro *Melitaea transcaucasica maculata* Gross & Ebert, 1975, nec *Melitaea asteroidea maculata* Staudinger, 1901 – Koçak 1980 (31.v.) **2 (1979)** (4): 141

grossi **sp. n.** (*Agrotis*) – Hacker & Kuhna 1986 (31.xii.) **9** (3/4): 180

grossi **sp. n.** (*Nemapogon*) – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 163

grunertiana Ratzeburg, 1868 (*Tortrix*), **stat. rev.**; now: *Cydia* – Falck & Karsholt 1993 (30.xi.) **16** (2): 82

gudarica **sp. n.** (*Rheumaptera*) – Dufay 1983 (31.iii.) **6** (1): 49

guidoi da Silva Cruz, 1978 (ssp. of *Coscinia cribraria*), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 232
gypsella **sp. n.** (*Coleophora*) – Baldizzone 1982 (30.vi.) **5** (2/3): 73

haasi Rebel, 1902 (*Borkhausenia*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16. vi.) **25 (2002)** (4): 217
hackeri **sp. n.** (*Victrix* (*Rasihia*)) – Varga & Ronkay 1991 (30.ix.) **14** (2): 168
hagiosana Razowski, 1959 (ssp. of *Cnephasia pumicana*), **syn. n.** of *Cnephasia pasiuana* (Hübner, 1796) – Razowski 1989 (31.i.) **11 (1988)** (4): 288
halmyropis Meyrick, 1926 (*Epidola*), **syn. n.** of *Metanarsia incertella* (Herrich-Schäffer, 1861) – Bidzilya 2005 (7.vi.) **27 (2004)** (4): 292
halperini **ssp. n.** (of *Pseudoterpna coronillata*) – Hausmann 1996 (21.xi.) **19** (1/2): 16
hampsoni Rothschild, 1914 (*Diacrisia*), **LT**; **syn. n.** of *Spilosoma todara* Moore, 1872 – Thomas 1990 (30.ix.) **13** (2/3): 181
hannemanni **sp. n.** (*Auchmis*) – Plante 1986 (31.iii.) **9** (1/2): 93
hartigi **sp. n.** (*Archicnephasia*) – Razowski 1983 (31.xii.) **6** (4): 232
heliacalis Zerny, 1914 (*Evergestis*), **LT**; **syn. n.** of *Evergestis anartalis* (Staudinger, 1892) – Nuss 2005 (7.vi.) **28** (1): 18
Helianthocampa **gen. n.** (Thaumetopoeidae) – Freina & Witt 1985 (30.vi.) **8** (2): 176
heliochalca Meyrick, 1928 (*Nemotois*), **syn. n.** of *Nemophora cantharites* (Meyrick, 1928) – Kozlov & Robinson 1996 (31.i.) **18 (1995)** (1): 53
hellenica **sp. n.** (*Eudarcia* (*Meessia*)) – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 165
hepatica Clerck, 1759 (*Phalaena*), **LT**; now: *Lithophane* – Mikkola 1993 (30.xi.) **16** (2): 139
herati **sp. n.** (*Scythris*) – Passerin d'Entrèves & Roggero 2004 (31.i.) **26 (2003)** (3/4): 157
herbuloti Agenjo, 1952 (*Sterrha*), **syn. n.** of *Idaea minuscularia* Ribbe, 1912 – Mentzer 1990 (31.i.) **12 (1989)** (4): 298
herminiella **sp. n.** (*Micropterix*) – Corley 2007 (15.v.) **30** (1): 74
herniariae de Joannis, 1908 (*Scythris*), **LT**; Now: *Scythris ventosella* Chrétien, 1907 – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 142
herrenschmidti **sp. n.** (*Eupithecia*) – Mentzer & Moberg 1992 (31.iii.) **14 (1991)** (4): 313
herzi **sp. n.** (*Porrittia*) – Ustjuzhanin 2001 (21.xii.) **24** (3): 20
heterospora Meyrick, 1924 (*Phthorimaea*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233
hiberica **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 207
himalayalta **sp. n.** (*Leptopterix*) – Hättenschwiler 1985 (31.iii.) **8** (1): 27
hippeis Meyrick, 1901 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233
hiranoi **sp. n.** (*Epimarptis*) – Sugisima 2004 (23.xii.) **27** (2/3): 200
hispanica Marten, 1943 (ssp. of *Macrothylacia diagramma*), **syn. n.** of *Macrothylacia diagramma alphacaria* – Freina & Witt 1984 (31.iii.) **7** (1): 31

hispanica Obraztsov, 1950 (*Cnephasia*), **syn. n.** of *Cnephasia stephensiana stephensiana* (Doubleday, 1849) – Razowski 1989 (31.i.) **11 (1988)** (4): 287

hispanica **sp. n.** (*Synansphecia*) – Kallies 1999 (15.vi.) **22** (2): 92

hissarella Noreika, **sp. n.** (*Phyllonorycter*) – Noreika & Puplesis 1992 (31.xii.) **15** (2): 144

hissarica Solyanikov, 1993 (*Fumea*), **comb. n.**; now: *Psyche* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265

hoerburgeri Schawerda, 1924 (*Polyploca*), **comb. n.**; now: *Achlya* – Yoshimoto 1989 (30.vi.) **12** (2): 160

hoerhammeri Wagner, 1931 (*Heliophobus*), **bona sp.**; now: *Lophoterges* – Dufay 1982 (30.vi.) **5** (2/3): 77

holsatica Sauber, 1916 (var. of *Nola centonalis*), **stat. rev.**; now: ssp. of *Nola aerugula* – Fibiger & Karsholt 1998 (15.x.) **21** (3): 200

honei Meyrick, 1935 (*Nemotois*), **LT**; **syn. n.** of *Nemophora decisella* (Walker, 1863) – Kozlov & Robinson 1996 (31.i.) **18 (1995)** (1): 45

hospitali Marten, 1948 (ssp. of *Coscinia striata*), **LT**; **syn. n.** of *Spiris striata striata* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 227

huebneri **nom. n.** pro *Papilio narica* Charpentier, 1818, nec Fabricius 1793 – Koçak 1980 (31.v.) **2 (1979)** (4): 140

huemeri **sp. n.** (*Micropterix*) – Kurz et al. 2004 (31.i.) **26 (2003)** (3/4): 112

huemeri **sp. n.** (*Oegoconia*) – Sutter 2007 (15.v.) **30** (1): 192

humiliella Herrich-Schäffer, 1855 (*Bucculatrix*), **LT** – Mey 1999 (1.ix.) **22** (3): 218

hyalina Solyanikov, 1993 (*Fumea*), **comb. n.**; now: *Megalophanes* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 266

hyalinella Caradja, 1920 (*Scythris*), **LT**; – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 142

hydrargyrana Eversmann, 1844 (*Tortrix*), **LT**; now: *Eugnosta* – Nedoshivina 2007 (15.v.) **30** (1): 104

hypsoides Rothschild, 1914 (*Diacrisia*), **LT**; now: *Spilosoma* – Thomas 1990 (30.ix.) **13** (2/3): 183

hyrcanica Riley, 1939 (ssp. of *Strymon ledereri*), **stat. rev.**; **comb. n.**; now: *Armenia* – Weidenhoffer & Eckweiler 1988 (31.i.) **10 (1987)** (4): 243

hyrcanica **sp. n.** (*Pasiphila*) – Viidalepp & Mironov 2006 (17.ii.) **28 (2005)** (3/4): 198

ialbum Esper, 1789 (*Papilio*), **sp. rev.**; now: *Polygonia ialbum* – Koçak 1980 (31.v.) **2 (1979)** (4): 140

iana sp. n. (*Conistra*) – Zilli & Grassi 2006 (14.viii.) **29** (1/2): 102

iberica **sp. n.** (*Ceratoxanthis*) – Baixeras 1992 (31.iii.) **14 (1991)** (4): 294

ignorata **sp. n.** (*Scotopteryx*) – Huemer & Hausmann 1998 (1.xii.) **21** (4): 242

illigerella Hübner, 1813 (*Calotripis*), **NT**; now: *Epermenia* – Scholz 1996 (13.v.) **18 (1995)** (3/4): 290

illigerellus Stainton, 1849 (*Elachista*), **syn. n.** of *Epermenia* (*Calotripis*) *insecurella* (Stainton, 1849) – Gaedike 1993 (30.iv.) **15 (1992)** (3/4): 231

Ilseopsis Povolný, 1965 (Gelechiidae), **syn. n.** of *Scrobipalpa* – Sattler 1988 (31.i.) **10 (1987)** (4): 225

imbutella Christoph, 1888 (*Depressaria*), **comb. n.**; now: *Orophia* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 219

imerina Griveaud, 1977, **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

imitatella Herrich-Schäffer, 1855 (*Bucculatrix*), **syn. n.** of *Bucculatrix cristatella* Zeller, 1839 – Mey 1999 (1.ix.) **22** (3): 216

immundana Eversmann, 1844 (*Grapholitha* [sic!]), **LT**; now: *Epibactra* – Nedoshivina 2007 (15.v.) **30** (1): 106

imperialis Rebel, 1900 (*Adela*), **syn. n.** of *Nemophora decisella* (Walker, 1863) – Kozlov & Robinson 1996 (31.i.) **18 (1995)** (1): 43

impunctella Amsel, 1940 (f. of *Apatema fasciata*), **LT**; **stat. rev.**; now: *Apatema impunctella* – Sutter 2006 (17.ii.) **28 (2005)** (3/4): 232

incerta **sp. n.** (*Parornix*) – Triberti 1982 (31.iii.) **5** (1): 41

inclusella Lederer, 1855 (*Butalis*), **LT**; now: *Scythris* – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 146

incommoda Butler, 1882, **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

infantula Kitt, 1926 (ssp. of *Nola subchlamydula*), **LT**; **syn. n.** of *Nola subchlamydula subchlamydula* Staudinger, 1870 – Freina & Witt 1984 (30.vi.) **7** (2): 134

infraclara Verity, 1953 (ssp. of *Erebia pandrose*), **syn. n.** of *Erebia pandrose marmolata* Dannehl, 1927 – Cupedo 2007 (15.xi.) **30** (2): 346

infracta Braun, 1926 (*Epermenia*), **syn. n.**; now: *Epermenia strictella* (Wocke, 1867) – Gaedike 1993 (30.xi.) **16** (2): 98

infumata Staudinger, 1887, **syn. n.** of *Furcula bicuspis* (Borkhausen, 1790) – Schintlmeister et al. 1987 (30.vi.) **10** (2): 97

ingana Fruhstorfer, 1911 (ssp. of *Erebia pandrose*), **syn. n.** of *Erebia pandrose pandrose* (Borkhausen, 1788) – Cupedo 2007 (15.xi.) **30** (2): 343

ingeborgae Traugott-Olsen, 1994 (*Biselachista*), **syn. n.** of *Elachista juliensis* Frey, 1870 – Kaila & Varalda 2004 (23.xii.) **27** (2/3): 220

iniquellus Wocke, 1867 (*Chauliodus*), **stat. n.**; now: *Epermenia* (*Cataplectica*) – Gaedike 1993 (30.iv.) **15 (1992)** (3/4): 231

insequana Eversmann, 1844 (*Tortrix*), **LT**; now: *Eugnosta parreyssiana* (Duponchel, 1843) – Nedoshivina 2007 (15.v.) **30** (1): 107

inspersa Staudinger, 1879 (var. of *Bombyx rimicola*) **stat. rev.**; now: *Eriogaster inspersa* – Zolotuhin, 2007 (15.v.) **30** (1): 46

insulariella **sp. n.** (*Nemophora*) – Kozlov 1997 (1.vi.) **20** (1/2): 32

insulella Staudinger, 1859 (*Butalis*), **LT**; now: *Scythris* – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 156

interpositella Strand, 1922 (*Eilema*), **syn. n.** of *Eilema uniola* (Rambur, 1866) – Freina & Witt 1984 (31.xii.) **7** (4): 334 – According Toulgoët (1985 (30.vi.): **8** (2): 189–199) is *interpositella* a **bona sp.**

interrupta Walsingham, 1881 (*Plutella*), **comb. n.**; now: *Rhigognostis* – Kyrki 1990 (31.iii.) **13** (1): 35

irakella Amsel, 1949 (*Bagdadia*) **LT**; – Sattler 1999 (1.xii.) **22** (4): 238

***irana* sp. n.** (*Kalliesia*) – Sobczyk 2004 (28.vi.) **27** (1): 22
***iranica* sp. n.** (*Agdistis*) – Alipanah & Ustjuzhanin 2007 (19.i.) **29 (2006)** (3/4): 178
***iranicola* nom. n.** pro *Agrotis forcipula hyrcana* Draudt, 1933, nec *Agrotis grisescens hyrcana* Staudinger, 1900 – Koçak 1980 (31.v.) **2 (1979)** (4): 144
***iranicola* nom. n.** pro *Plebeius pylaon iranica* Forster, 1939, nec *Plebeius eurypilus iranica* Forster, 1838 – Koçak 1980 (31.v.) **2 (1979)** (4): 141
irmella N. Palm, 1947 (*Lithocolletis*), **syn. n.** of *Phyllonorycter lautella* (Zeller, 1846) – Nieukerken et al. 2002 (1.iii.) **24 (2001)** (4): 18
irrorata Diakonoff, 1951 (ssp. of *Nemophora bifasciella*), **syn. n.** of *Nemophora decisella* (Walker, 1863) – Kozlov & Robinson 1996 (31.i.) **18 (1995)** (1): 43
isosema Meyrick, 1921 (*Chelaria*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238
***italohelveticus* sp. n.** (*Gnophos*) – Rezbanyai-Reser 1986 (31.iii.) **9** (1/2): 102

jacularia Hübner, 1813 (*Geometra*), **NT**; now: *Rhodostrophia* – Sihvonen & Nupponen 2005 (12.viii.) **28** (2): 116
***jaeckhi* sp. n.** (*Metriotes*) – Baldizzone 1985 (30.ix.): **8** (3): 204
***janhillmanni* sp. n.** (*Agrochola*) – Hacker & Moberg 1989 (30.vi.) **12** (2): 128
japonensis Rothschild, 1914 (ssp. of *Diacrisia rhodophila*), **LT**; now: *Lemyra inaequalis* (Butler, 1879) – Thomas 1990 (30.ix.) **13** (2/3): 179
japonica Draudt, 1935 (f. of *Panolis flammea*), **stat. n.**; now: *Panolis* – Kononenko & Mikkola 1989 (30.iv.) **12** (1): 30
japonica Oku, 1979 (15.xii.), **syn. n.** of *Peridaedalia optabilana* (Kuznetsov, 1979 (13. viii.)) – Razowski 1989 (31.i.) **11 (1988)** (4): 289
***johanssoni* sp. n.** (*Cydia*) – Aarvik & Karsholt 1993 (30.iv.) **15 (1992)** (3/4): 165
jugicola Wocke, 1877 (*Bucculatrix*), **LT**; **syn. n.** of *Bucculatrix cristatella* Zeller, 1839 – Mey 1999 (1.ix.) **22** (3): 216
jugicolella Zerny, 1936 (*Scythris*), **LT**; now: *Scythris ventosella* Chrétien, 1907 – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 142
jugurthina Grünberg, 1911, **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96
***juliana* ssp. n.** (of *Erebia flavofasciata*) – Cupedo 2000 (1.vii.) **23** (2): 181
junctivittella Christoph, 1885 (*Metanarsia*), **LT**; – Bidzilya 2005 (7.i.) **27 (2004)** (4): 290
juryi Puplesis, 1991 (*Stigmella*), **syn. n.** of *Stigmella paradoxa* (Frey, 1858) – Nieukerken et al. 2004 (23.xii.) **27** (2/3): 140
***jynxella* sp. n.** (*Coleophora*) – Baldizzone 1987 (31.iii.) **10** (1): 29

***kagizmanensis* nom. n.** pro *Lycaena osiris* Bang-Haas, 1927, nec *Lycaena osiris* Hopffer, 1855 – Koçak 1980 (31.v.) **2 (1979)** (4): 142
***Kalliesia* gen. n.** (Psychidae) – Sobczyk 2004 (28.vi.) **27** (1): 20
***kanishka* sp. n.** (*Pseudochazara*) – Aussem 1980 (1.vi.) **3** (1/2): 8
karategina Stshetkin, 1980, **syn. n.** of *Pheosia jullieni* Oberthür, 1911 – Schintlmeister et al. 1987 (30.vi.) **10** (2): 98

***karatyshica* sp. n.** (*Dahlica*) – Rutjan 2000 (1.iv.) **23** (1): 27

karelica Tengström, 1875 (var. of *Penthina postremana*), **stat. n.**; **comb. n.**; now: *Selenodes karelica* – Aarvik 1986 (31.xii.) **9** (3/4): 156

***karsholti* sp. n.** (*Dyscia* (subg. ?*Iberafrina*) – Wiltshire 1991 (31.v.) **14** (1): 91

***karsholti* sp. n.** (*Micronoctua*) – Fibiger 1997 (1.vi.) **20** (1/2): 28

***karsholti* sp. n.** (*Sciopetris*) – Hättenschwiler 1996 (21.xi.) **19** (1/2): 108

***kazachstaniella* sp. n.** (*Prorophora* (*Prorophora*)) – Asselbergs 2004 (28.vi.) **27** (1): 57

kikiae Wiltshire, 1982 (*Rhodometra*), **comb. n.**; now: *Casilda* – Hausmann 1993 (31. vii.) **16** (1): 32

kirghisica Viidalepp, 1988 (*Scopula*), **syn. n.** of *Scopuloides fucata* (Püngeler, 1909) – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 198

***klimeschi* sp. n.** (*Acrolita*) – Diakonoff 1985 (31.xii.): **8** (4): 302

***klimeschi* sp. n.** (*Tinagma*) – Gaedike 1987 (31.x.) **10** (3): 158

klimeschi Traugott-Olsen, 1994 (*Biselachista*), **syn. rev.** of *Elachista juliensis* Frey, 1870 – Kaila & Varalda 2004 (23.xii.) **27** (2/3): 220

***kohistana* sp. n.** (*Arctornis*) – Freina 1987 (30.vi.) **10** (2): 119

kononenkoi Kuznetsov **sp. n.** (*Olethreutes*) – Kuznetsov & Mikkola 1991 (31.xii.) **14** (3): 204

korbi Caradja, 1921 (*Pterophorus*), **LT**; **comb. n.**; **bona sp.**; now: *Leioptilus* – Gibeaux 1988 (31.x.) **11** (3): 187

korbi Grünberg, 1911 (*Macrothylacia*), **stat. n.**; **syn. n.** of *Macrothylacia diagramma alphacaria* – Freina & Witt 1984 (31.iii.) **7** (1): 31

***koreana* sp. n.** (*Coleophora*) – Baldizzone 1989 (30.iv.) **12** (1): 16

***kosterini* sp. n.** (*Stenoptilia*) – Ustjuzhanin 2001 (21.xii.) **24** (3): 12

kostjuki Sinev, 2001 (*Scythris*), **syn. n.** of *Scythris immaculatella* (Chambers, 1875) – Passerin d'Entrèves & Roggero 2004 (31.i.) **26 (2003)** (3/4): 159

kruegeri Turati, 1911 (*Nola*), **syn. n.** of *Nola subchlamydula subchlamydula* Staudinger, 1870 – Freina & Witt 1984 (30.vi.) **7** (2): 134

***kudrnai* nom. n.** pro *Lycaena orbitulus rebeli* Tuleschkow, 1932, nec *Lycaena alcon rebeli* Hirschke, 1904 – Koçak 1980 (31.v.) **2 (1979)** (4): 142

kuldzhella Lvovsky, 1982 (*Callima*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16. vi.) **25 (2002)** (4): 217

kumatai Povolný, 1976 (*Empista*), **comb. n.**; now: *Kiwaia* (*Empista*) – Sattler 1988 (31.i.) **10 (1987)** (4): 234

kurentsovi Filipjev, 1962 (*Cnephasia*), **syn. n.** of *Cnephasia stephensiana stolidana* (Walker) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

***kurentzovi* nom. n.** pro *Lycaena argus orientalis* Kurentzov, 1970, nec *Lycaena amanda orientalis* Staudinger, 1901 – Koçak 1980 (31.v.) **2 (1979)** (4): 142

kuwayamae Matsumura, 1919, **stat. n.**; now: ssp. of *Ptilodon capucina* (Linnaeus, 1758) – Schintlmeister et al. 1987 (30.vi.) **10** (2): 97

***kuznetsovi* nom. n.** for *Croesia bicolor* Kuznetsov, 1964, nec *Acleris bicolor* Kawabe, 1963; now: *Acleris* – Razowski 1989 (31.i.) **11 (1988)** (4): 285

ladislai Oberthür, 1880 (*Lophopteryx*), **comb. n.**; now: *Ptilodon* – Schintlmeister et al. 1987 (30.vi.) **10** (2): 99

laetornata **sp. n.** (*Clepsis*) – Wang et al. 2003 (30.x.) **26** (1/2): 50

lafauryi **sp. n.** (*Scythris*) – Passerin d'Entrèves 1986 (31.xii.) **9** (3/4): 219

lakoniensis **sp. n.** (*Micropterix*) – Heath 1985 (31.xii.): **8** (4): 336

lambessanus Staudinger, 1901 (var. of *Satyrus abdelkader*), **stat. n.**; now *Berberia* – Tennent 1994 (31.iii.) **16 (1993)** (3/4): 310

lamii Schadewald, 1992 (*Phlogophora*), **syn. n.** of *Phlogophora meticulosa* (Linnaeus, 1758) – Fibiger 1993 (31.vii.) **16** (1): 18

landryi **sp. n.** (*Scythris*) – Passerin d'Entrèves & Roggero 2004 (31.i.) **26 (2003)** (3/4): 156

lanigera Butler, 1877 (*Cerura*), **syn. n.** of *Cerura sangaica* Moore, 1877 – Schintlmeister 1989 (30.xi.) **12** (3): 206

lanjeronica **ssp. n.** (of *Eucrostes indigenata*) – Hausmann 1996 (21.xi.) **19** (1/2): 43

lapikella **sp. n.** (*Nemophora*) – Kozlov 1997a (1.vi.) **20** (1/2): 40

lapillosa Meyrick, 1924 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

larseni **sp. n.** (*Phtheochroa*) – Huemer 1990 (31.i.) **12 (1989)** (4): 278

lata Treitschke, 1835, (*Agrotis*), **bona sp.**; **stat. rev.**; **LT**; – Zilli 1992 (31.v.) **15** (1): 74

laurinata Schawerda, 1919 (*Horisme*), **syn. n.** of *Horisme radicaria* de la Harpe, 1855 – Rezbanyai-Reser 1984 (31.xii.) **7** (4): 350

lemuria Hering, 1926, **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

lenis Philpott, 1929 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

leucanthemella Constant, 1895 (*Bucculatrix*), **syn. n.** of *Bucculatrix alpina* Frey, 1870 – Mey 1999 (1.ix.) **22** (3): 214

leucobela Meyrick, 1934 (*Enscepastra*), **comb. n.**; now: *Coleophora* – Baldizzone 1981 (31.iii.) **4** (1/2): 11

leucocyanea Zukowsky, 1929 (*Synanthedon*), **comb. n.**; now: *Adixoa* – Kallies 2007 (15.xi.) **30** (2): 392

leucogaster Mann, 1872 (*Butalis*), **LT**; now: *Scythris tenuivittella* (Stainton, 1867) – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 151

lichyi Carbonell & Brevignon, 1983 (ssp. of *Archon apollinus*), **syn. n.** of *Archon apollinus apollinus* (Herbst, 1798) – Freina 1985 (30.vi.) **8** (2): 127

limbopunctata Strand, 1915 (*Hypena*), **comb. n.**; now: *Dichromia* – Lödl 1994 (31.iii.) **16 (1993)** (3/4): 243

linella Piskunov, 1975 (*Scrobipalpa*), **syn. n.** of *Scrobipalpa clintoni* Povolný, 1968 – Povolný 1982 (30.vi.) **5** (2/3): 125

linophagana Rebel, 1939 (*Cnephasia*), **syn. n.** of *Cnephasia pasiuana* (Hübner, 1796) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

liriophorella **sp. n.** (*Coleophora*) – Baldizzone 1982 (30.vi.) **5** (2/3): 60

lithodes Meyrick, 1885 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

***lithoxys* ssp. n.** (of *Victrix karsiana*) – Varga & Ronkay 1989 (30.iv.) **12** (1): 74
***longiductella* sp. n.** (*Coleophora*) – Baldizzone 1989 (30.vi.) **12** (2): 109
longulana Eversmann, 1844 (*Teras*), **LT**; now: *Acleris lacordairana* (Duponchel, 1836) – Nedoshivina 2007 (15.v.) **30** (1): 108
***lucasi* sp. n.** (*Stenoptilia*) – Arenberger 1990 (30.ix.) **13** (2/3): 101
lucidaria Swinhoe, 1904 (*Pseudosterrha*), **comb. n.**; now: *Casilda* – Hausmann 1993 (31.vii.) **16** (1): 32
luridata Hufnagel, 1767 (*Phalaena*), **NT**; now: *Scotopteryx* – Huemer & Hausmann 1998 (1.xii.) **21** (4): 260
lusitanica Marten, 1943 (ssp. of *Macrothylacia diagramma*), **syn. n.** of *Macrothylacia diagramma alphacaria* – Freina & Witt 1984 (31.iii.) **7** (1): 31
lutzernovi Chnéour, 1956 (*Lasiocampa*), **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96
lycurgus Fabricius, 1793 (*Papilio*), **sp. rev.**; now: *Charaxes lycurgus* – Koçak 1980 (31.v.) **2 (1979)** (4): 140

machinella Bradley, 1971 (*Coleophora*), **syn. n.** of *Coleophora gardesanella* Toll, 1953 – Baldizzone 1981 (30.ix.) **4** (3): 64
mactana Rebel, 1894 (*Pandemis*), **syn. n.** of *Choristoneura simonyi* (Rebel, 1892) – Razowski 1979 (17.viii.) **2** (1/2): 57
maculosella Stainton, 1851 (*Gelechia*), **LT**; now: *Acompsia* (*Acompsia*) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 119
***maghrebina* sp. n.** (*Coleophora*) – Baldizzone 1982 (30.vi.) **5** (2/3): 68
***magna* sp. n.** (*Reisseronia*) – Hättenschwiler 1982 (31.iii.) **5** (1): 25
***magyarica* sp. n.** (*Coleophora*) – Baldizzone 1983 (30.vi.) **6** (2/3): 69
***magyarus* sp. n.** (*Tosirips*) – Razowski 1987 (31.iii.) **10** (1): 91
***maltensis* ssp. n.** (of *Xylena exsoleta*) – Fibiger et al. 2007 (19.i.) **29 (2006)** (3/4): 202
***mandarinca* sp. n.** (*Eupithecia*) – Mironov 2001 (10.viii.) **24** (1/2): 27
marcida Mann, 1859 (*Lithosia*), **syn. n.** of *Eilema pygmaeola sordidula* (Rambur, 1858) – Freina & Witt 1984 (31.xii.) **7** (4): 333
marcosae Agenjo, [1977] (ssp. of *Coscinia cribraria*), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 232
Mardinia Amsel, 1952, **syn. n.** of *Pyrausta* Schrank, 1802 – Maes 2002 (1.iii.) **24 (2001)** (4): 54
***mariannae* sp. n.** (*Ethmia*) – Karsholt & Kun 2003 (16.vi.) **25 (2002)** (4): 208
***marmorella* sp. n.** (*Dahlica*) – Herrmann 1988 (31.i.) **10 (1987)** (4): 204
maroccana Marten, 1943 (ssp. of *Macrothylacia diagramma*), **syn. n.** of *Macrothylacia diagramma diagramma* – Freina & Witt 1984 (31.iii.) **7** (1): 27
***maroccana* sp. n.** (*Synansphecia*) – Kallies 1999 (15.vi.) **22** (2): 90
marteni Chnéour, 1935 (ab . of *Satyrus abdelkader*), **syn. n.** of *Berberia abdelkader nelvai* Seitz, 1911 – Tennent 1994 (31.iii.) **16 (1993)** (3/4): 305
massalis Walker, 1859 (*Dosara*), **comb. n.**; now: *Achyra* – Maes 1987 (31.x.) **10** (3): 177

matermea Povolný, 1974 (*Empista* (*Zeempista*)), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

mauritanica Staudinger, 1891 (*Lasiocampa*), **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96

mayrella Hübner, 1813 (*Tinea*), **NT**; now: *Coleophora* – Stübner 2007 (15.v.) **30** (1): 152

mediae **sp. n.** (*Coleophora*) – Baldizzone 1990 (30.ix.) **13** (2/3): 109

mediterranea **sp. n.** (*Coleophora*) – Baldizzone 1990 (31.xii.) **13** (4): 201

mediterranea **sp. n.** (*Gelechia*) – Huemer 1991 (30.ix.) **14** (2): 125

megalatlasica Tarrier, 1996 (ssp. of *Melanargia occitanica*), **syn. n.** of *Melanargia occitanica pelagia* Oberthür, 1911 – Tennent 1999 (1.iii.) **22** (1): 52

megerlella Hübner, 1810 (*Tinea*), **sp. rev.**; now: *Adela* – Kozlov & Kaila 2002 (1.iii.) **24 (2001)** (4): 5

melli Zukowsky, 1929 (*Aegeria*), **comb. n.**; now: *Glossosphecia* – Kallies 2007 (15. xi.) **30** (2): 388

mellitta Meyrick, 1934 (*Phalonia*), **comb. n.**; now: *Piercea* Filipjev, 1940 – Razowski 1992 (31.iii.) **14 (1991)** (4): 325

mendesi **sp. n.** (*Agonopterix*) – Corley 2002 (1.iii.) **24 (2001)** (4): 26

meridionalis Tutt, 1901 (*Lasiocampa*), **syn. n.** of *Lasiocampa quercus quercus* – Freina & Witt 1983 (30.vi.) **6** (2/3): 93

mesomelaena Hampson, 1902 (*Hypena*), **comb. n.**; now: *Dichromia* – Lödl 1994 (31.iii.) **16 (1993)** (3/4): 243

messmeri Schadewald, 1992 (*Autographa*), **syn. n.** of *Autographa gamma* (Linnaeus, 1758) – Fibiger 1993 (31.vii.) **16** (1): 18

metallicella Fuchs, 1903 (*Coleophora*), **NT**; **syn. n.** of *Coleophora cuprariella* Lienig & Zeller, 1847 – Stübner 2007 (15.v.) **30** (1): 144

meteorica **sp. n.** (*Scrobipalpa*) – Povolný 1984 (30.ix.) **7** (3): 268

micrasiatica **ssp. n.** (of *Turanana taygetica*) – Courtsis 2006 (14.viii.) **29** (1/2): 18

Microbaena **gen. n.** (Geometridae) – Hausmann 1996 (21.xi.) **19** (1/2): 21

Microloxiini tribus n. (Geometridae) – Hausmann 1996 (21.xi.) **19** (1/2): 56

Micronoctua **gen. n.** (Noctuidae) – Fibiger 1997 (1.vi.) **20** (1/2): 24

miguelensis Le Cerf, 1935 (ssp. of *Satyrus azorinus*), **comb. n.**; **stat. n.**; now: *Hipparchia* (*azorina*) – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 176

mikkolai **sp. n.** (*Cauchas*) – Kozlov 1993 (30.xi.) **16** (2): 114

Mimcochylis **gen. n.** (Tortricidae) – Razowski 1985 (31.iii.) **8** (1): 61

minimella **sp. n.** (*Mirificarma*) – Huemer & Karsholt 2001 (21.xii.) **24** (3): 48

minimella **sp. n.** (*Myeloiodes*) – Asselbergs 2004 (28.vi.) **27** (1): 53

minor Alhéraky, 1892 (var. of *Eusarca jacularia*), **syn. n.** of *Rhodostrophia jacularia* (Hübner, 1813) – Sihvonen & Nupponen 2005 (12.viii.) **28** (2): 114

minor **ssp. n.** (of *Microbaena pulchra*) – Hausmann 1996 (21.xi.) **19** (1/2): 23

minorella Rebel, 1899 (*Brachycrossata*), **LT**; now: *Acompsia* (*Acompsia*) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 124

minuscularia Ribbe, 1912 (ssp. of *Acidalia virgularia*), **comb. n.**; **stat. n.**; now: *Idaea* – Mentzer 1990 (31.i.) **12 (1989)** (4): 298

minuta **sp. n.** (*Dryadaula*) – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 160

minuta Walsingham, 1900 (*Capua*), **comb. n.**; now: *Minutargyrotoza* – Yasuda & Razowski 1991 (30.ix.) **14** (2): 189

Minutargyrotoza **gen. n.** (Tortricidae) – Yasuda & Razowski 1991 (30.ix.) **14** (2): 188

mirana Kuznetsov, 1981 (*Aphiaris*), **syn. n.** of *Ukamenia sapporensis* (Matsumura, 1931) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

miranda Oberthür, 1894 (*Chelonia*), **comb. n.**; now: ssp. of *Spiris striata* – Freina & Witt 1984 (30.ix.) **7** (3): 229

mirzaellus **nom. n.** pro *Lycaena mirza* Plötz, 1880, nec *mirza* Staudinger – Koçak 1980 (31.v.) **2 (1979)** (4): 141

modesta Staudinger, 1871 (*Metanarsia*), **LT**; – Bidzilya 2005 (7.i.) **27 (2004)** (4): 280

mongolensis **nom. n.** pro *Lycaena damon mongolica* Kurentzov, 1970, nec *Lycaena argus mongolica* Rühl, 1893 – Koçak 1980 (31.v.) **2 (1979)** (4): 143

moni **sp. n.** (*Melittia*) – de Freina 2007 (15.v.) **30** (1): 52

monophragma Meyrick, 1885 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

monotona Amsel, 1953 (*Thyridopsis*), **comb. n.**; now: *Epimetasia* – Nuss et al. 2006 (14.viii.) **29** (1/2): 41

monotonica Kuznetsov **sp. n.** (*Gypsonoma*) – Kuznetsov & Mikkola 1991 (31.xii.) **14** (3): 211

montana Bergmann, 1953, **syn. n.** of *Lasiocampa quercus quercus, f. alpina* – Freina & Witt 1983 (30.vi.) **6** (2/3): 93

monticola Moriuti, 1982 (*Phaulernis*), **syn. n.** of *Phaulernis fulviguttella* (Zeller, 1939) – Gaedike 1993 (30.xi.) **16** (2): 92

mosaica **sp. n.** (*Altipolia*) – Plante 1985 (31.xii.): **8** (4): 364

Moureia Orfila & Rossi, 1956 (Noctuidae), **stat. n.**; now subgenus of *Victrix* Staudinger, 1879 – Varga & Ronkay 1989 (30.iv.) **12** (1): 69

moyaerii Ebert, 1971 (*Ochrostigma*), **comb. n.**; now: *Drymonia* – Schintlmeister et al. 1987 (30.vi.) **10** (2): 98

mucronata Scopoli, 1763 (*Phalaena*), **NT**; now: *Scotopteryx* – Huemer & Hausmann 1998 (1.xii.) **21** (4): 255

muralis **sp. n.** (*Acanthopsyche*) – Hättenschwiler 2004 (28.vi.) **27** (1): 72

mutilata Strand, 1909 (*Hypena*), **comb. n.**; now: *Dichromia* – Lödl 1994 (31.iii.) **16 (1993)** (3/4): 242

Myeloiodes **gen. n.** (Pyralidae) – Asselbergs 2004 (28.vi.) **27** (1): 51

nadezhdae Lvovsky, 1985 (*Promalactis*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 217

nanosella **sp. n.** (*Postsolenobia*) – Petru & Liska 2003 (30.x.) **26** (1/2): 3

narymica **ssp. n.** (*Erebia pandrose*) – Cupedo 2007 (15.xi.) **30** (2): 343

neapolitana Stauder, 1921 (f. of *Satyrus semele*), **LT**; now: *Hipparchia senthes* – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 204

nedae **sp. n.** (*Infurcitinea*) – Baldizzone 1983 (31.iii.) **6** (1): 17

neglecta Philpott, 1924 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

neglectus **sp. n.** (*Brachodes*) – Kallies 1998 (15.x.) **21** (3): 184

Neogaurena Roepke, 1944 (Noctuidae), **syn. n.** of *Takapsestis* Matsumura, 1933 – Yoshimoto 1990 (31.xii.) **13** (4): 239

Neostauropus Kiriakoff, 1967, **syn. n.** of *Stauropus* Germar, 1812 – Schintlmeister et al. 1987 (30.vi.) **10** (2): 97

neriaria Herrich-Schäffer, 1852 (*Geometra* (*Phorodesma*)), **comb. n.**; now: *Proteuchloris* – Hausmann 1996 (21.xi.) **19** (1/2): 25

nesiotica **sp. n.** (*Cnephasia*) – Razowski 1983 (31.xii.) **6** (4): 235

nevadella **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 211

nielseni **sp. n.** (*Scythris*) – Passerin d'Entrèves & Roggero 2004 (31.i.) **26 (2003)** (3/4): 158

nigromaculata **ssp. n.** (of *Pseudocinglis benigna*) – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 209

nigroramosa Christoph, 1893, **comb. n.**; now: ssp. of *Paradrymonia vittata* (Staudinger, 1892) – Schintlmeister et al. 1987 (30.vi.) **10** (2): 98

nippei de Freina, 1988 (*Eriogaster*), **syn. n.** of *Eriogaster inspersa* Staudinger, 1879 – Zolotuhin 2007 (15.v.) **30** (1): 46

nivella **sp. n.** (*Merrifieldia*) – Ustjuzhanin 2001 (21.xii.) **24** (3): 22

obfuscata Nakamura, 1978 (ssp. of *Phalera birmicola*), **syn. n.** of *Phalera grotei* Moore, 1859 – Schintlmeister 1989 (30.xi.) **12** (3): 206

obliquella Stainton, 1854 (*Elachista*), **NT** – Kozlov & Kaila 2002 (1.iii.) **24 (2001)** (4): 7

obscurella Klemensiewicz, 1899 (var. of *Bucculatrix fatigatella*), **syn. n.** of *Bucculatrix humiliella* Herrich-Schäffer, 1855 – Mey 1999 (1.ix.) **22** (3): 218

obscuriolas Betti, 1977 (ssp. of *Iolana iolas*), **syn. n.** of *Iolana iolas iolas* – Fazekas 1984 (31.iii.) **7** (1): 22

occidentalis Bivar de Sousa, 1982 (ssp. of *Hipparchia* (*Parahipparchia*) *azorina*), **syn. n.**; **comb. n.**; **stat. n.**; now: ssp. of *Hipparchia* (*azorina*) *azorina* – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 172

occidentalis Rothschild, 1914 (ssp. of *Diacrisia obliqua*), **LT**; now: *Spilosoma bisecta* Leech, 1888 – Thomas 1990 (30.ix.) **13** (2/3): 179

ochricolor Erschoff, 1877 (*Oecophora*), **comb. n.**; now: *Crassa* – Lvovsky 2003 (16. vi.) **25 (2002)** (4): 218

ochrocephala **sp. n.** (*Nemophora*) – Kozlov 1997 (1.vi.) **20** (1/2): 35

Ochrognesiini Inoue, 1961 (Geometridae), **syn. n.** of Nemoriini Gumppenberg, 1887 – Hausmann 1996 (21.xi.) **19** (1/2): 31

ochroplasta **sp. n.** (*Mimcochylis*) – Razowski 1985 (31.iii.) **8** (1): 64

omanica **sp. n.** (*Leucoptera*) – Mey 1998 (10.vii.) **21** (2): 107

omanirana **sp. n.** (*Creatonotus*) – de Freina 2007 (15.xi.) **30** (2): 376

obliquana Eversmann, 1844 (*Cochylis*), **LT**; now: *Cochylimorpha* – Nedoshivina 2007 (15.v.) **30** (1): 108

obtusana Eversmann, 1844 (*Teras*), **LT**; now: *Acleris* – Nedoshivina 2007 (15.v.) **30** (1): 108

ochrographa **sp. n.** (*Bactra* (*Chiloides*)) – Diakonoff 1989 (31.i.) **11 (1988)** (4): 243

onurcani **sp. n.** (*Perizoma*) – Can & Mironov 2006 (17.ii.) **28 (2005)** (3/4): 163

orbiculata **sp. n.** (*Rhopalovalva*) – Zhang & Li 2004 (23.xii.) **27** (2/3): 241

oreina **sp. n.** (*Chersotis*) – Dufay 1984 (31.iii.) **7** (1): 8.

origalis Brandt, 1941 (*Glossostrophia*), **comb. n.**; now: *Scopuloides* – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 201

Orinympha Meyrick, 1927 (Yponomeutidae), **syn. n.** of *Atemelia* – Kyrki 1990 (31. iii.) **13** (1): 36

orobi Stainton, 1870 (*Cemiostoma*) **LT**; now: *Leucoptera* – Kaila & Wikström 2004 (23.xii.) **27** (2/3): 188

orpheus **sp. n.** (*Aricia* (*Ultraaricia*)) – Nekrutenko 1980 (1.vi.) **3** (1/2): 63

orphicus **ssp. n.** of *Polyommatus dantchenkoi* – Kolev 2005 (7.vi.) **28** (1): 26

osmana **sp. n.** (*Gortyna*) – Hacker & Kuhna 1986 (31.xii.) **9** (3/4): 184

ossealis Staudinger, 1880 (*Metasia*), previously a syn. of *Palepicorsia ustrinalis*, **stat. rev.**; **LT**; now bona sp. of *Metasia* – Maes 2002 (1.iii.) **24 (2001)** (4): 52

osthelderi **sp. n.** (*Phtheochroa*) – Huemer 1990 (31.i.) **12 (1989)** (4): 278

ovata **sp. n.** (*Rhopalovalva*) – Zhang & Li 2004 (23.xii.) **27** (2/3): 240

oxiana Djakonov, 1929 (*Paragluphisia*), **comb. n.**; now: *Gluphisia* – Schintlmeister et al. 1987 (30.vi.) **10** (2): 101

paghmanus **sp. n.** (*Brachodes*) – Kallies 1998 (15.x.) **21** (3): 187

palaearctica palaearctica Povolný, 1968 (*Empista*), **comb. n.**; now: *Kiwaia* (*Empista*) – Sattler 1988 (31.i.) **10 (1987)** (4): 234

palaearctica secunda Povolný, 1976 (*Empista*), **comb. n.**; now: *Kiwaia* (*Empista*) – Sattler 1988 (31.i.) **10 (1987)** (4): 234

palaestinensis Staudinger, 1901 (var. of *Melanargia titea*), **LT**; **syn. n.** of *Melanargia titea titanea* – Wagener 1983 (30.vi.) **6** (2/3): 181

palawanicola **nom. n.** pro *Papilio macareus maccabeus* Staudinger, 1889, nec Herbst, 1796 – Koçak 1980 (31.v.) **2 (1979)** (4): 139

Palepicorsia Maes, 1995 (Crambidae), **stat. rev.** – Maes 2002 (1.iii.) **24 (2001)** (4): 53

pallidella Zagulajev, 1997 (*Solenobia*), **comb. n.**, now: *Dahlica* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265

pallidior Spuler, 1892 (ssp. of *Doritis apollinus*), **syn. n.** of *Archon apollinaris apollinaris* (Staudinger, [1892]) – Freina 1985 (30.vi.) **8** (2): 127

palmensis **sp. n.** (*Luffia*) – Sobczyk 2002 (1.iii.) **24** (2001) (4): 12

paludicola Wallengren, 1859 (*Mimaeseoptilus*), **LT**; **syn. n.** of *Stenoptilia pterodactyla* (Linnaeus, 1761) – Arenberger 1990 (30.ix.) **13** (2/3): 97

palumbaria [Denis & Schiffermüller], 1775 (*Geometra*), **NT**; now: *Scotopteryx* – Huemer & Hausmann 1998 (1.xii.) **21** (4): 260

palumbaria Treitschke, 1827 (*Aspilates*), **LT**; now: *Scotopteryx* – Huemer & Hausmann 1998 (1.xii.) **21** (4): 256

pamphyla **sp. n.** (*Synanthedon*) – Kallies 2003 (30.x.) **26** (1/2): 38

pannonica Daniel, 1955 (ssp. of *Coscinia cribraria*), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 232

Paraargyresthia (Argyresthiidae), **syn. n.** of *Argyresthia* – Kyrki 1990 (31.iii.) **13** (1): 36

parachalca Meyrick, 1916 (*Scythris*), **LT**; – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 147

paradisea Butler, 1881 (*Nemotois*), **syn. n.** of *Nemophora decisella* (Walker, 1863) – Kozlov & Robinson 1996 (31.i.) **18 (1995)** (1): 43

Paragluphisia Djakonov, 1929, **syn. n.** of *Gluphisia* Boisduval, 1828 – Schintlmeister et al. 1987 (30.vi.) **10** (2): 101

parallelifascia Rothschild, Hartert & Jordan, 1917 (ssp. of *Metanastria diagramma*), **stat. n.**; **syn. n.** of *Macrothylacia diagramma alphacaria* – Freina & Witt 1984 (31.iii.) **7** (1): 31

Parametanarsia Gerasimov, 1930 (Gelechiidae), **syn. n.** of *Metanarsia* Staudinger, 1871 – Bidzilya 2005 (7.i.) **27 (2004)** (4): 274

parapleura Meyrick, 1885 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

paroctas Meyrick, 1913 (*Chelaria*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

parodia Gozmány, 1988 (*Oegoconia*), **comb. n.**; now: *Apatema* – Sutter 2007 (15.v.) **30** (1): 201

parvula Philpott, 1930 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

parvulana Wilkinson, 1859 (*Catoptria*), **LT**; **sp. rev.**; now: *Eucosma* – Agassiz & Langmaid 2004 (28.vi.) **27** (1): 46

pelopides **ssp. n.** of *Kretania eurypilus* Freyer – Poorten 1984 (30.vi.) **7** (2): 164

pelsonius **ssp. n.** of *Agriphila tolli* Bleszynski – Fazekas 1985 (31.iii.) **8** (1): 17

pelsonius (ssp. of *Agriphila tolli*), **syn. n.** of *Agriphila tolli tolli* Bleszynski – Gozmány 1985 (30.ix.): **8** (3): 285

pentactinana Mann, 1855 (*Cochylis*), **syn. n.** of *Stenodes decolorella* (Zeller, 1839) – Sattler 1986 (31.xii.) **9** (3/4): 257

peramplana Hübner, 1825 (*Epagoge*), **comb. n.**; now: *Aphelia* – Speidel & Aarvik 2002 (1.viii.) **25** (1): 19

peregrina **sp. n.** (*Prays*) – Agassiz 2007 (15.xi.) **30** (2): 408

pergrandella Rebel, 1917 (*Gelechia*), **LT**; **comb. n.**; now: *Chionodes* – Sattler 1986 (31.xii.) **9** (3/4): 257

perixesta Collenette, 1961 (*Euproctis*), **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

perlana Frölich, 1830 (*Tortrix*), **syn. n.** of *Eublemma pulchralis* (Villers, 1789) – Speidel & Aarvik 2002 (1.viii.) **25** (1): 20

perpulchrana Kennel, 1901 (*Tortrix*), **comb. n.**; now: *Tosirips* – Razowski 1987 (31.iii.) **10** (1): 88

persana **sp. n.** (*Coleophora*) – Baldizzone 1990 (30.ix.) **13** (2/3): 114

persica **sp. n.** (*Thetidia* (*Antonechloris*)) – Hausmann 1996 (21.xi.) **19** (1/2): 27

persimilana Rebel, 1894 (*Pandemis*), **syn. n.** of *Choristoneura simonyi* (Rebel, 1892) – Razowski 1979 (17.viii.) **2** (1/2): 57

persimilis Rothschild, 1914 (*Diacrisia*), **LT**; now: *Spilosoma* – Thomas 1990 (30.ix.) **13** (2/3): 181

perunovi Dubatolov, 1990 (ssp. of *Holoarctia cervini*), **comb. n.**; now: ssp. of *Holoarctia puengeleri* – Pöyry & Kullberg 1997 (1.vi.) **20** (1/2): 61

peterseni **sp. n.** (*Infurcitinea*) – Baldizzone 1984 (30.ix.) **7** (3): 197

peterseni Povolný, 1965 (*Ilseopsis*), **comb. n.**; now: *Scrobipalpa* – Sattler 1988 (31.i.) **10 (1987)** (4): 231

pfisteri **ssp. n.** (of *Setina aurita*) – Burmann & Tarmann 1985 (30.ix.): **8** (3): 247

Phaiogramma Gumppenberg, 1887 (Geometridae), **stat. n. –** Hausmann 1996 (21.xi.) **19** (1/2): 50

phantasma Marten, 1955 (ssp. of *Lemonia philopalus*), **syn. n.** of *Lemonia philopalus vazquezi* Oberthür, 1916 – Freina & Witt 1983 (30.vi.) **6** (2/3): 90

Phantosoma **gen. n.** (Lasiocampidae) – Zolotuhin & Kostjuk 2000 (1.vii.) **23** (2): 141

pharetria Meyrick, 1886 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

phasmatica Meyrick, 1937 (*Meritastis*), **comb. n.**; now: *Amphicoecia* – Razowski 1989 (31.i.) **11 (1988)** (4): 285

piae **sp. n.** (*Ptilocephala*) – Hättenschwiler 1996 (13.v.) **18 (1995)** (3/4): 241

piculus **sp. n.** (*Acalyptris*) – Puplesis 1990 (31.iii.) **13** (1): 85

pinkeri **sp. n.** (*Coleophora*) – Baldizzone 1982 (30.vi.) **5** (2/3): 57

piskunovi **sp. n.** (*Metanarsia*) – Bidzilya 2005 (7.i.) **27 (2004)** (4): 288

pista Diakonoff, 1984 (*Phalonidia*), **comb. n.**; now: *Piercea* Filipjev, 1940 – Razowski 1992 (31.iii.) **14 (1991)** (4): 325

plagiusa **sp. n.** (*Mimcochylis*) – Razowski 1985 (31.iii.) **8** (1): 62

planola **sp. n.** (*Mimcochylis*) – Razowski 1985 (31.iii.) **8** (1): 61

plasmodia **sp. n.** (*Mimcochylis*) – Razowski 1985 (31.iii.) **8** (1): 62

Platphalonidia **gen. n.** (Tortricidae) – Razowski 1985 (31.iii.) **8** (1): 58

platyphyllae Oku, 1965 (*Coleophora*), **syn. n**. of *Coleophora zelleriella* Heinemann, 1854 – Baldizzone 1981 (30.ix.) **4** (3): 69

plemochoa Meyrick, 1916 (*Phthorimaea*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

plumbaria Fabricius, 1775 (*Phalaena*), **LT**; now: ssp. of *Scotopteryx luridata*. – Huemer & Hausmann 1998 (1.xii.) **21** (4): 260

polemia Prout, 1920 (*Microloxia*), **comb. n.**; now: *Phaiogramma* – Hausmann 1996 (21.xi.) **19** (1/2): 53

Poliobrya Hampson, 1908 (Noctuidae), **stat. n.**; now subgenus of *Victrix* Staudinger, 1879 – Varga & Ronkay 1989 (30.iv.) **12** (1): 69

***ponomarenkoae* sp. n.** (*Acompsia* (*Acompsia*)) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 128

porrectella Caradja, 1920 (ssp. of *Scythris grandipennis*), **LT**; now: *Scythris grandipennis* (Haworth, 1828) – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 143

poulella Busck, 1904 (*Plutella*), **comb. n.**; now: *Rhigognostis* – Kyrki 1990 (31.iii.) **13** (1): 35

powelli Le Cerf, 1916 (*Chamaesphecia*), **comb. rev.** from *Synansphecia* – Kallies 1999 (15.vi.) **22** (2): 110

powelli Oberthür, 1922, **sp. rev.**; now *Brachodes* – Kallies & Spatenka 2002 (15.xi.) **25** (2/3): 156

praeposita Toll, 1952 (*Coleophora*), **syn. n.** of *Coleophora involucrella* Chrétien, 1905 – Baldizzone 1981 (30.ix.) **4** (3): 71

praesaga Corti, 1932 (*Euxoa*), **syn. n.** of *Euxoa cos crimea* – Plante 1983 (30.vi.) **6** (2/3): 136

predotaria Hartig, 1951 (ssp. of *Sterrha incarnaria*), **LT**; **stat. n.**; **comb. n.**; now: *Idaea* – Raineri 1989 (30.xi.) **12** (3): 188

prodigellus Zeller, 1853, **sp. rev.**; now: *Nemotois* – Kozlov 2004 (31.i.) **26 (2003)** (3/4): 121

producta Walker, 1863 (*Euproctis*), **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

***protector* sp. n.** (*Douzdrina*) – de Laever 1985 (30.vi.) **8** (2): 149

protector de Laever, 1985 (*Douzdrina*), **syn. n.** of *Spodoptera exigua* (Hübner, 1808) – de Bros 1985 (31.xii.) **8** (4): 385

***Proteuchloris* gen. n.** (Geometridae) – Hausmann 1996 (21.xi.) **19** (1/2): 24

pruinosata (Staudinger, 1898) (*Holoterpna*), **LT**; – Hausmann 1996 (21.xi.) **19** (1/2): 18

***pseudoalbiflua* sp. n.** (*Episcythris*) – Passerin d'Entrèves 1991 (31.v.) **14** (1): 56

***Pseudocinglis* gen. n.** (Geometridae) – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 203

***pseudofuscoaenea* sp. n.** (*Coleophora*) – Stübner 2007 (15.v.) **30** (1): 158

***pseudohumigena* sp. n.** (*Euxoa*) – Plante 1984 (31.xii.) **7** (4): 347

***pseudojezonica* ssp. n.** (of *Emmelina jezonica*) – Derra 1987 (31.iii.) **10** (1): 71

puengeleri O. Bang-Haas, 1927 (*Orodemnias*), **stat. rev.**; now: *Holoarctia* – Pöyry & Kullberg 1997 (1.vi.) **20** (1/2): 55

***pulchra* sp. n.** (*Phaulernis*) – Gaedike 1993 (30.xi.) **16** (2): 93

pulchra Staudinger, 1897 (*Phorodesma*), **comb. n.**; now: *Microbaena* – Hausmann 1996 (21.xi.) **19** (1/2): 22

pullana Eversmann, 1844 (*Sericoris*) **LT**; now: *Epinotia cruciana* (Linnaeus, 1761) – Nedoshivina 2007 (15.v.) **30** (1): 109

pulmentaria Guenée, 1857 (*Chlorissa*), **comb. n.**; now: *Phaiogramma* – Hausmann 1996 (21.xi.) **19** (1/2): 51

pulverana Eversmann, 1844 (*Tortrix*), **LT**; now: *Clepsis senecionana* (Hübner, 1819) – Nedoshivina 2007 (15.v.) **30** (1): 109

pumicana Zeller, 1847 (*Sciaphila*), **syn. n.** of *Cnephasia pasiuana* (Hübner, 1796) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

pumila Philpott, 1928 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

punctigera Freyer, 1834 (Bombyx), **syn. n.** of *Coscinia cribraria cribraria* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 231

punica **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 216

purpurea **sp. n.** (*Altipolia*) – Plante 1985 (31.xii.): **8** (4): 365

purpureus Stainton, 1867 (*Nemotois*), **syn. n.** of *Nemotois fasciella* (Fabricius, 1775) – Kozlov 2004 (31.i.) **26 (2003)** (3/4): 122

putilla Saalmüller, 1884 (*Euproctis*) **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

pyrenaella **sp. n.** (*Acompsia* (*Acompsia*)) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 117

pyrenaella **sp. n.** (*Penestoglossa*) – Herrmann 2006 (14.viii.) **29** (1/2): 90

pyrophagana Rebel, 1939 (*Cnephasia*), **syn. n.** of *Cnephasia pasiuana* (Hübner, 1796) – Razowski 1989 (31.i.) **11 (1988)** (4): 288

quadratana Eversmann, 1844 (*Grapholitha*), **LT**; now: *Epiblema sticticana* (Fabricius, 1894) – Nedoshivina 2007 (15.v.) **30** (1): 110

quadrativalvata **sp. n.** (*Gnorismoneura*) – Wang et al. 2004 (28.vi.) **27** (1): 84

quieta Philpott, 1927 (*Phthorimaea*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

radicaria de la Harpe, 1855 (*Horisme*), **NT**; – Rezbanyai-Reser 1984 (31.xii.) **7** (4): 352

radiolana Eversmann, 1844 (*Teras*), **LT**; now: *Catoptria verella* Zincken, 1817 – Nedoshivina 2007 (15.v.) **30** (1): 113

radoti Homberg, 1911 (ssp. of *Hypopta caestrum*), **stat. n.**; now: *Parahypopta* – Yakovlev 2007 (15.xi.) **30** (2): 418

ragusai Verity, 1919 (ssp. of *Thymelicus acteon*), **sp. rev.**; now: *Thymelicus ragusai* – Koçak 1980 (31.v.) **2 (1979)** (4): 143

raikhonae Noreika, **sp. n.** (*Phyllonorycter*) – Noreika & Puplesis 1992 (31.xii.) **15** (2): 131

ramosella Müller-Rutz, 1934 (*Lita*), **sp. rev.**; **LT**; now: *Scrobipalpula* – Huemer & Karsholt 1998 (8.iii.) **21** (1): 51

rangnowi (ssp. of *Lycaeides argyrognomon*), **nom. n.** pro *Lycanea ismenias violaceus* Rangnow, 1935, nec *Lycaena splendens violaceus* Staudinger, 1892 – Koçak 1980 (31.v.) **2 (1979)** (4): 141

raptans **sp. n.** (*Coleophora*) – Baldizzone 1989 (30.vi.) **12** (2): 114

redae **sp. n.** (*Satyrium*) – Bozano 1993 (30.iv.) **15** (1992) (3/4): 179

reisseri **ssp. n.** (of *Euchloe tagis*) – Back & Reissinger 1989 (30.vi.) **12** (2): 96

relicta Koshantschikov, 1923 (*Duomitella*), **LT**; now: *Scardia boletella* (Fabricius, 1794) – Yakovlev 2006 (17.ii.) **28 (2005)** (3/4): 159

remizella **sp. n.** (*Coleophora*) – Baldizzone 1983 (30.vi.) **6** (2/3): 74

renatae **sp. n.** (*Merrifieldia*) – Skyva & Elsner 2007 (15.v.) **30** (1): 115

***renatae* sp. n.** (*Micropterix*) – Kurz et al. 1997 (10.xii.) **20** (3/4): 294
***renetae* sp. n.** (*Talis*) – Ganev & Hacker 1984 (30.ix.) **7** (3): 249
repentella Chrétien, 1908 (*Lita*), **LT**; **syn. n.** of *Caryocolum petryi* (Hofmann, 1899) – Huemer & Luquet 1992 (31.v.) **15** (1): 30
***repentis* sp. n.** (*Caryocolum*) – Huemer & Luquet 1992 (31.v.) **15** (1): 35
resplendella Stainton, 1851 (*Aechmia*), **LT**; now: *Heliozela* – Mutanen et al. 2007 (15.v.) **30** (1): 81
retusella Rebel, 1891 (*Xystophora*), **syn. n.** of *Scrobipalpula tussilaginis* (Stainton, 1867) – Huemer & Karsholt 1998 (8.iii.) **21** (1): 60
rhamniella Herrich-Schäffer, 1855 (*Bucculatrix*), **LT**; – Mey 1999 (1.ix.) **22** (3): 219
***rianella* sp. n.** (*Dahlica*) – Hättenschwiler 1981 (31.iii.) **4** (1/2): 21
***ribasella* sp. n.** (*Coleophora*) – Baldizzone 1982 (30.vi.) **5** (2/3): 70
***ribentella* sp. n.** (*Elachista*)) – Kaila & Varalda 2004 (23.xii.) **27** (2/3): 232
***rjabovianus* nom. n.** pro *Agrodiaetus rjabovi* Forster, 1960, nec *Lycaena thersites rjabovi* Obraztsov, 1936 – Koçak 1980 (31.v.) **2 (1979)** (4): 142
roboris Schrank, 1801, **syn. n.** of *Lasiocampa quercus quercus* – Freina & Witt 1983 (30.vi.) **6** (2/3): 93
romeii Rothschild, 1933 (ssp. of *Satyrus abdelkader*), **syn. n.** of *Berberia lambessanus* Staudinger, 1901 – Tennent 1994 (31.iii.) **16 (1993)** (3/4): 310
rosiphila Puplesis, **sp. n.** (*Ectoedemia*) – Puplesis et al. 1992 (31.v.) **15** (1): 55
***rotunda* sp. n.** (*Proutia*) – Suomalainen 1990 (31.xii.) **13** (4): 231
rufa Houlbert, 1921 (*Palimpsestis*), **LT**; **syn. n.** of *Tethea or* ([Denis & Schiffermüller], 1775) – Yoshimoto 1989 (30.xi.) **12** (3): 227
rufistrigata Hampson, 1896 (*Ephyra*), **comb. n.**; now: *Pseudosterrha* – Hausmann 1993 (31.vii.) **16** (1): 24
rugosana Hübner, 1799 (*Tortrix*), **NT**; now: *Phtheochroa* – Huemer 1990 (31.i.) **12 (1989)** (4): 272
ruizi Dionisio, 1980, **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96
rungsi Rougeot, 1971 (ssp. of *Lemonia philopalus*), **syn. n.** of *Lemonia philopalus vazquezi* Oberthür, 1916 – Freina & Witt 1983 (30.vi.) **6** (2/3): 90
ruoergensis Chou & Ying, 1979 (*Gynaephora*), **syn. n.** of *Gynaephora* (*Dasorgyia*) *selenophora* Staudinger, 1887 – Spitzer 1984 (30.vi.) **7** (2): 183
ruthae Traugott-Olsen, 1994 (*Biselachista*) **syn. n.** of *Elachista occidentalis* Frey, 1882 – Kaila & Varalda 2004 (23.xii.) **27** (2/3): 226

sachalinensis Matsumura, 1930 (*Lithosia*), **LT**; now: *Eilema* (*Collita*) *griseola sachalinensis* – Ignatyev & Witt, 2007 (15.v.) **30** (1): 29
saharae Slaby, 1981 (ssp. of *Berberia abdelkader*), **syn. n.** of *Berberia abdelkader taghzefti* Wyatt, 1952 – Tennent 1994 (31.iii.) **16 (1993)** (3/4): 308
***saifulica* ssp. n.** (of *Brahmaea wallichii*) – Freina & Witt 1982 (30.vi.) **5** (2/3): 81
***saleri* sp. n.** (*Idaea*) – Domínguez & Baixeras 1992 (31.xii.) **15** (2): 103
salicicola Park, 1995 (*Capidentalia*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

salicicolella Kuznetzov, 1960 (*Nothris*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

sammuti **sp. n.** (*Cydia* (*Kenneliola*)) – Diakonoff 1986 (31.xii.) **9** (3/4): 170

samnitica Dannehl, 1929, **syn. n.** of *Lasiocampa trifolii trifolii* – Freina & Witt 1983 (30.vi.) **6** (2/3): 95

sapindivora Clarke, 1958 (*Chelaria*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238

sappadensis **sp. n.** (*Scythris*) – Bengtsson & Sutter 1992 (31.xii.) **15** (2): 95

sardoa Turati, 1913, **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96

sareptensis Rothschild, 1912 (*Cossus*), **comb. n.**; now: *Holcocerus* – Yakovlev 2004 (23.xii.) **27** (2/3): 195

sarobiella (*Paratinea*), **comb. n.**; now: *Crypsithyris* – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 167

schahrudensis **nom. n.** pro *Pieris chloridice albidice* Staudinger, 1901, nec *Pieris daplidice albidice* Oberthür, 1881 – Koçak 1980 (31.v.) **2 (1979)** (4): 139

schematica Meyrick, 1885 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

schepleri **sp. n.** (*Acompsia* (*Acompsia*)) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 129

sciurella **sp. n.** (*Coleophora*) – Baldizzone 1987 (31.iii.) **10** (1): 33

scopoli Carnelutti & Michieli, 1960, **syn. n.** of *Lasiocampa quercus dalmatina* – Freina & Witt 1983 (30.vi.) **6** (2/3): 94

Scopuloides **gen. n.** (Geometridae) – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 196

scurella Herrich-Schäffer, 1854 (*Calotrypis*), **syn. n.** of *Epermenia* (*Epermenia*) *scurella* (Stainton, 1851) – Gaedike 1993 (30.iv.) **15 (1992)** (3/4): 230

scutana Constant, 1893 (*Grapholitha*), **syn. n.** of *Eucosma parvulana* (Wilkinson, 1859) – Agassiz & Langmaid 2004 (28.vi.) **27** (1): 46

scutifera **sp. n.** (*Nemapogon*) – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 164

scythica **sp. n.** (*Mehara*) – Komarov & Zolotuhin 2005 (7.vi.) **28** (1): 52

sellingi **sp. n.** (*Orthosia*) – Fibiger et al. 1996 (13.v.) **18 (1995)** (3/4): 204

semidiaphana Zukowsky, 1929 (*Paranthrene*), **comb. n.**; now: *Nokona* – Kallies 2007 (15.xi.) **30** (2): 391

semifasciata Failla, 1888, **syn. n.** of *Lasiocampa trifolii cocles* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96

semisudetica **ssp. n.** (of *Erebia melampus*) – Cupedo 1996 (29.ii.) **18 (1995)** (2): 116

senecai **sp. n.** (*Dyscia*) – Wiltshire 1990 (31.i.) **12 (1989)** (4): 355

seravshanica Stshetkin, 1984 (ssp. of *Pseudothecla cyri*), **comb. n.**; now: ssp. of *Armenia hyrcanica* – Weidenhoffer & Eckweiler 1988 (31.i.) **10 (1987)** (4): 244

sericata **sp. n.** (*Amicta*) – Hättenschwiler & Alemansoor 2006 (14.viii.) **29** (1/2): 80

serrata **sp. n.** (*Gnorismoneura*) – Wang et al. 2004 (28.vi.) **27** (1): 84

Setema **gen. n.** (Arctiidae) – Freina & Witt 1984 (31.xii.) **7** (4): 331

shohami **sp. n.** (*Myinodes*) – Hausmann 1994 (30.xi.) **17** (1/2): 38

sibiricus Caradja, 1921 (var. of *Pterophorus scarodactylus*), **LT**; **syn. n.** of *Leioptilus distinctus* (Herrich-Schäffer, 1855) – Gibeaux 1988 (31.x.) **11** (3): 187

siciliana Oberthür, 1914 (ssp. of *Satyrus semele*), **syn. n.**; **LT**; now: *Hipparchia senthes* – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 204

siliquella Constant, 1893 (*Coleophora*), **syn. n**. of *Coleophora oriolella* Zedller, 1849 – Baldizzone 1981 (30.ix.) **4** (3): 71

similella **sp. n.** (*Nemapogon*) – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 162

similis Fuessly, **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56

simonyi Rebel, 1892 (*Pandemis*), **comb. n.**, now: *Choristoneura* – Razowski 1979 (17.viii.) **2** (1/2): 57

sinecarina **sp. n.** (*Phtheochroa*) – Huemer 1990 (31.i.) **12 (1989)** (4): 275

sinevi **sp. n.** (*Nemophora*) – Kozlov 1997 (1.vi.) **20** (1/2): 33

sinjovi **sp. n.** (*Epermenia* (*Calotripis*)) – Gaedike 1993 (30.xi.) **16** (2): 99

skoui **sp. n.** (*Xanthorhoe*) – Viidalepp & Hausmann 2004 (31.i.) **26 (2003)** (3/4): 104

slovenica Daniel, 1939 (ssp. of *Coscinia striata*), **syn. n.** of *Spiris striata striata* (Linnaeus, 1758) – Freina & Witt 1984 (30.ix.) **7** (3): 227

sonamagensis **sp. n.** (*Altipolia*) – Plante 1985 (31.xii.): **8** (4): 365

sordidior Rothschild, 1914 (ssp. of *Bombyx decolorata*), **syn. n.** of *Lasiocampa decolorata decolorata* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96

sordidula Rambur, 1858 (*Lithosia*), **stat. n.**; now: ssp. of *Eilema pygmaeola* – Freina & Witt 1984 (31.xii.) **7** (4): 333

Sphrageidus **gen. n.** (Lymantriidae) – Maes 1984 (31.iii.) **7** (1): 56

spinosa Povolný, 1976 (*Empista*), **comb. n.**; now: *Kiwaia* (*Empista*) – Sattler 1988 (31.i.) **10 (1987)** (4): 234

splendida Gerber, 1979 (ssp. of *Orodemnias cervini*), **syn. n.** of *Holoarctia cervini* (Fallou, 1864) – Pöyry & Kullberg 1997 (1.vi.) **20** (1/2): 50

staudingeri **sp. n.** (*Brachodes*) – Kallies 1998 (15.x.) **21** (3): 180

stefanii de Joannis, 1899 (*Coleophora*), **syn. n**. of *Coleophora seriipennella* Christoph, 1872 – Baldizzone 1981 (30.ix.) **4** (3): 73

Stenopteron **gen. n.** (Tortricidae) – Razowski 1989 (31.i.) **11 (1988)** (4): 287

stettinensis Leraut, 2003, **syn. n.** of *Acleris effractana* (Hübner, 1799) – Karsholt et al. 2005 (12.viii.) **28** (2): 94

stigmatana Eversmann, 1844 (*Tortrix*), **LT**; now: *Aphelia* – Nedoshivina 2007 (15.v.) **30** (1): 110

strictelloides Gaedike, 1977 (*Epermenia*), **syn. n.** of *Epermenia strictella* (Wocke, 1867) – Gaedike 1993 (30.xi.) **16** (2): 98

subaerariella Stainton, 1867 (*Butalis*), **LT**; now: *Scythris* – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 150

subalpina Agassiz, 1900, **syn. n.** of *Lasiocampa quercus quercus, f. alpina* – Freina & Witt 1983 (30.vi.) **6** (2/3): 93

subflabella Stainton, 1867 (*Butalis*), **LT**; now: *Scythris inclusella* Lederer, 1855 – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 146

subzuzukiella Lvovsky, 1985 (*Promalactis*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 217

***sulcitana* ssp. n.** (of *Zygaena* (*Agrumenia*) *orana*) – Bordoni & Leo 1985 (30.ix.): **8** (3): 269

sutshana Draudt, 1935 (f. of *Panolis flammea*), **syn. n.** of *Panolis japonica* Draudt, 1935 – Kononenko & Mikkola 1989 (30.iv.) **12** (1): 31

syriaca Osthelder, 1933 (ssp. of *Parastichtis monoglypha*), **comb. n.**; **bona sp.**; now: *Apamea* – Dufay 1984 (30.vi.) **7** (2): 114

***syriacus* ssp. n.** (of *Tosirips magyarus*) – Razowski 1987 (31.iii.) **10** (1): 91

***syriella* sp. n**. (*Acompsia* (*Telephila*)) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 133

***tabestana* sp. n.** (*Rhodostrophia*) – Trusch & Hausmann, 2007 (15.v.) **30** (1): 8

tachengensis Cai, 1979, **syn. n.** of *Pterostoma palpina* (Clerck, 1759) – Schintlmeister et al. 1987 (30.vi.) **10** (2): 98

tadzhikella Lvovsky, 1982 (*Callima*), **comb. n.**; now: *Epicallima* – Lvovsky 2003 (16.vi.) **25 (2002)** (4): 217

***takowensis* sp. n.** (*Achyra*) – Maes 1987 (31.x.) **10** (3): 178

talassica Puplesis, **sp. n.** (*Stigmella*) – Puplesis et al. 1992 (31.v.) **15** (1): 54

***talgarella* sp. n.** (*Cauchas*) – Kozlov 1993 (30.xi.) **16** (2): 117

talgarica Solyanikov, 1991 (*Fumea*), **comb. n.**; now: *Bruandia* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265

tallosi Kovács & Varga, 1969 (*Apamea*), **syn. n.** of *Apamea syriaca* – Dufay 1984 (30.vi.) **7** (2): 114

tamensis Waters, 1929 (*Coleophora*), **status rev.**; now: *Coleophora cratipennella* Clemens, 1864 – Baldizzone & J.-F. Landry 1993 (31.vii.) **16** (1): 4

***tanaella* sp. n.** (*Elachista*) – Aarvik & Berggren 2004 (31.i.) **26 (2003)** (3/4): 84

tanis Swinhoe, 1917 (*Hypena*), **comb. n.**; now: *Dichromia* – Lödl 1994 (31.iii.) **16 (1993)** (3/4): 243

taurella Caradja, 1920 (*Scythris*), **LT**; **syn. n.** of *Scythris balanophora* Meyrick, 1916 – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 148

***tauromeniella* sp. n.** (*Scythris*) – Passerin d'Entrèves & Roggero 2004 (31.i.) **26 (2003)** (3/4): 154

taygetica Rebel, 1902 (var. of *Lycaena panagaea*), **stat. n.**; **NT**; now: ssp. of *Turanana taygetica* – Coutsis 2005 (7.i.) **27 (2004)** (4): 266

***tayulingensis* sp. n.** (*Mamestra*) – Yoshimoto 1989 (31.i.) **11 (1988)** (4): 290

tecticola Thomann, 1951 (*Setina*), **syn. n.** of *Setina aurita aurita* (Esper, 1787) – Burmann & Tarmann 1985 (30.ix.): **8** (3): 263

***teichiana* sp. n.** (*Dichrorampha*) – Šulcs & Kerppola 1997 (10.xii.) **20** (3/4): 301

***teneriffella* sp. n.** (*Coleophora*) –Baldizzone 1987 (31.iii.) **10** (1): 30

tenuata Fuchs, 1880, **syn. n.** of *Lasiocampa quercus quercus* – Freina & Witt 1983 (30.vi.) **6** (2/3): 93

tenuivittella Stainton, 1867 (*Butalis*), **LT**; now: *Scythris* – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 151

terebra Denis & Schiffermüller, 1775 (*Bombyx*) **comb. n.**; now: *Acossus* – Yakovlev 2007 (15.xi.) **30** (2): 417

tergana Eversmann, 1844 (*Tortrix*), **LT**; now: *Aethes triangulana* (Treitschke, 1835) – Nedoshivina 2007 (15.v.) **30** (1): 111

tertia **sp. n.** (*Noctua*) – Mentzer et al. 1991 (31.v.) **14** (1): 37

testaceana Eversmann, 1844 (*Tortrix*), **LT**; now: *Archips rosana* (Linnaeus, 1758) – Nedoshivina 2007 (15.v.) **30** (1): 111

Thermocrates Meyrick, 1936, **syn. n.** of *Dryadaula* Meyrick, 1893 – Robinson 1988 (30.iv.) **11** (1): 74

thomasi **sp. n.** (*Oncocnemis*) – Plante 1986 (31.iii.) **9** (1/2): 97

thracicus Buresch, 1915 (var. of *Doritis apollinus*), **syn. n.** of *Archon apollinus apollinus* (Herbst, 1798) – Freina 1985 (30.vi.) **8** (2): 126

thyraula Meyrick, 1885 (*Gelechia*), **comb. n.**; now: *Kiwaia* (*Kiwaia*) – Sattler 1988 (31.i.) **10 (1987)** (4): 233

Thyridopsis Amsel, 1953, **syn. n.** of *Epimetasia* Ragonot, 1894 – Nuss et al. 2006 (14. viii.) **29** (1/2): 38

tianshanica Seksjaeva **sp. n.** (*Bucculatrix*) – Puplesis et al. 1992 (31.v.) **15** (1): 59

tilosi Manil, 1984 (ssp. of *Hipparchia wyssii*), **stat. n.**; now: *Hipparchia* – Wiemers 1991 (31.xii.) **14** (3): 271

titania Caberla, 1891 (var. of *Melanargia titea*), **NT**; now: ssp. of *Melanargia titea* – Wagener 1983 (30.vi.) **6** (2/3): 181

titania Standfuss, 1892 (var. of *Melanargia titea*), **NT**; now: *Melanargia titea standfussi* **nom. n.** pro *titea titania* Standfuss, 1892 – Wagener 1983 (30.vi.) **6** (2/3): 185

titea Klug, 1832 (*Hipparchia*), **LT**; now: ssp. of *Melanargia titea* – Wagener 1983 (30.vi.) **6** (2/3): 177

Tosirips **gen. n.** (Tortricidae) – Razowski 1987 (31.iii.) **10** (1): 87

totanae **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 212

toubkalella **sp. n.** (*Gracillaria*) – Prins 1985 (31.xii.): **8** (4): 351

toulechkoffi **nom. n.** pro *Hadena platinea grisescens* Toulechkoff, 1951, nec *Hadena basilinea grisescens* Staudinger, 1889 – Koçak 1980 (31.v.) **2 (1979)** (4): 144

transsilvanica **sp. n.** (*Siederia*) – Herrmann & Weidlich 1999 (1.iii.) **22** (1): 12

traugotti **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 210

traugotti **sp. n.** (*Teleiodes*) – Huemer & Karsholt 2001 (21.xii.) **24** (3): 47

tremalzoi **sp. n.** (*Scythris*) – Bengtsson & Sutter 1992 (31.xii.) **15** (2): 93

tribertii **sp. n.** (*Infurcitinea*) – Baldizzone 1983 (31.iii.) **6** (1): 17

trichophagoides Zerny, 1935 (*Tinea*), **syn. n.** of *Xerantica tephroclysta* Meyrick, 1930 – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 168

trichopterella **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 208

tridentifera **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 214

trimaculata (*Paratinea*), **comb. n.**; now: *Crypsithyris* – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 167

trimaura **sp. n.** (*Strepsicrates*) – Diakonoff 1985 (31.xii.): **8** (4): 306

tripunctella [Denis & Schiffermüller], 1775, **NT**; now: *Acompsia* (*Acompsia*) – Huemer & Karsholt 2002 (15.xi.) **25** (2/3): 125

tripsiana Eversmann, 1844 (*Tortrix*), **LT**; now: *Phtheochroa inopiana* (Haworth, 1811) – Nedoshivina 2007 (15.v.) **30** (1): 112

trisyllaba Puplesis, **sp. n.** (*Stigmella*) – Puplesis et al. 1992 (31.v.) **15** (1): 51
troughti Amsel, 1955 (*Eochorica*), **comb. n.**; now: *Typhonia* – Sobczyk 2004 (28.vi.) **27** (1): 25
tsekouensis **ssp. n.** (of *Sephisa dichroa*) – Nguyen 1984 (31.xii.) **7** (4): 340
tshatkalica Solyanikov, 1991 (*Fumea*), **comb. n.**; now: *Bruandia* – Sauter & Hättenschwiler 1999 (1.xii.) **22** (4): 265
tugaella Ponomarenko, 1995 (*Capidentalia*), **comb. n.**; now: *Bagdadia* – Sattler 1999 (1.xii.) **22** (4): 238
tunisiae Stübner & Baldizzone, **sp. n.** (*Coleophora*) – Stübner, 2007 (15.v.) **30** (1): 138
tunisiana **sp. n.** (*Cydia*) – Aarvik & Karsholt 1993 (30.iv.) **15** (1992) (3/4): 167
turanicus Puplesis, 1984 (*Microcalyptris*), **syn. n.** of *Acalyptris lvovskyi* (Puplesis, 1984) – Puplesis 1990 (31.iii.) **13** (1): 67
turbidellus Caradja, 1921 (*Pterophorus* (var.?)), **LT**; **syn. n.** of *Leioptilus trimmatodactylus* (Christoph, 1872) – Gibeaux 1988 (31.x.) **11** (3): 188
turcica **sp. n.** (*Crypsithyris*) – Gaedike 2007 (19.i.) **29 (2006)** (3/4): 167
turcicola **nom. n.** pro *Agrotis forcipula obscurior* Draudt, 1933, nec *Agrotis sollers obscurior* Staudinger, 1889 – Koçak 1980 (31.v.) **2 (1979)** (4): 144
turkmeniella Piskunov, 1973 (*Scrobipalpa*), **syn. n.** of *Scrobipalpa maniaca* Povolný, 1969 – Povolný 1982 (30.vi.) **5** (2/3): 126
turkmeniella **sp. n.** (*Ethmia*) – Dubatolov & Ustjuzhanin 1998 (10.vii.) **21** (2): 101
turkmeniensis **sp. n.** (*Ocrisiodes*) – Asselbergs 2004 (28.vi.) **27** (1): 54
turlini Griveaud, 1977, **comb. n.**; now: *Sphrageidus* – Maes 1984 (31.iii.) **7** (1): 56
tutulella Zerny, 1927 (*Nola*), **syn. n.** of *Nola cucullatella cucullatella* (Linnaeus, 1758) – Freina & Witt 1984 (30.vi.) **7** (2): 133

umbraculana Eversmann, 1844 (*Teras*), **LT**; now: *Pelochrista* – Nedoshivina 2007 (15.v.) **30** (1): 100
undulata Danilevskij, 1962, **comb. n.**; now *Phtheochroa* – Razowski 1989 (31.i.) **11 (1988)** (4): 285
unicolorata **sp. n.** (*Hemidromodes*) – Hausmann 1996 (21.xi.) **19** (1/2): 62
unicolorella De Joannis, 1909 (*Scythris*), **LT**; now: *Scythris grandipennis* (Haworth, 1828) – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 143
uralskiensis Gibeaux, 1995 (*Gillmeria*), **syn. n.** of *Gillmeria armeniaca* (Zagulajev, 1984) – Ustjuzhanin 2001 (21.xii.) **24** (3): 25
urartua **sp. n.** (*Brachylomia*) – Hacker & Kuhna 1986 (31.xii.) **9** (3/4): 181
urartua **sp. n.** (*Hyponephele*) – Freina & Aussem 1986 (31.xii.) **9** (3/4): 200
urbahni **ssp. n.** (of *Aplocera praeformata*) – Dufay 1981 (31.iii.) **4** (1/2): 16
urmijensis Zagulajev, 1996 (*Agdistis*), **syn. n.** of *Agdistis frankeniae* (Zeller, 1874) – Alipanah & Ustjuzhanin 2007 (19.i.) **29 (2006)** (3/4): 178
Urodidae new family (Type-genus *Urodus*) – Kyrki 1988 (30.iv.) **11** (1): 53
usambaraensis **nom. n.** pro *Papilio brontes australis* Van Someren, 1961, nec *Papilio rumina australis* Esper, 1781 – Koçak 1980 (31.v.) **2 (1979)** (4): 139

ustrinalis Christoph, 1877 (*Botys*), **comb. n.**; now: *Palepicorsia* – Maes 2002 (1.iii.) **24** (2001) (4): 53

valesiana Rebel, 1907 (*Olethreutes*), **comb. n.**; now: *Phiaris* – Speidel & Aarvik 2002 (1.viii.) **25** (1): 19

valletai de Lattin, 1952 (ssp. of *Hipparchia algirica*), **syn. n.** of *Hipparchia senthes* – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 205

valletai Valletta, 1972 (ssp. of *Hipparchia algirica*), **syn. n.** of *Hipparchia senthes* – Olivier & Coutsis 1997 (10.xii.) **20** (3/4): 205

vallicolella Costa, 1885 (ssp. of *Agriphila latistria*), **NT**; **syn. n.** of *Agriphila latistria latistria* (Haworth, 1811) – Fazekas 1990 (30.ix.) **13** (2/3): 125

vandarbani Pfeiffer, 1937 (ssp. of *Lycaena hyacinthus*), **comb. n.**; **stat. n.**; now: *Aricia* (*Ultraaricia*) – Nekrutenko 1980 (1.vi.) **3** (1/2): 62

vanderwolfi **sp. n.** (*Coleophora*) – Baldizzone 1985 (30.ix.): **8** (3): 213

vantshica Viidalepp, 1988 (*Scopula*), **comb. n.**; **stat. n.**; now: ssp. of *Scopuloides origalis* – Hausmann 1994 (31.iii.) **16 (1993)** (3/4): 202

variicornis Toll, 1952 (*Coleophora*), **stat. rev. –** Nuss & Stübner 2003 (30.x.) **26** (1/2): 29

vasconiella Rössler, 1877 (*Lita*), **comb. n.**; now: *Scrobipalpa* – Povolný 1987 (31.iii.) **10** (1): 82

vasilevi Ganev, 1983 (*Agriphila*), **syn. n.** of *Agriphila brioniella* (Zerny, 1914) – Fazekas 1990 (30.ix.) **13** (2/3): 120

vasilevi **sp. n.** (*Agriphila*) – Ganev 1983 (31.xii.) **6** (4): 210

vastaria Christoph, 1877 (*Eusarca*), **LT**; now: *Rhodostrophia* – Trusch & Hausmann, 2007 (15.v.) **30** (1): 15

ventosella Chrétien, 1907 (*Scythris*), **LT**; – Passerin d'Entrèves 1996 (29.ii.) **18 (1995)** (2): 141

venustana Frölich, 1828 (*Tortrix*), **syn. n.** of *Celypha aurofasciana* (Haworth, 1811) – Speidel & Aarvik 2002 (1.viii.) **25** (1): 19

venustana Frölich, 1828 (*Tortrix*), **syn. n.** of *Celypha aurofasciana* (Haworth, 1811) – Speidel & Aarvik 2002 (1.viii.) **25** (1): 19

verkerki **sp. n.** (*Eudarcia* (*Abchagleris*)) – Gaedike & Henderickx 1999 (1.iii.) **22** (1): 3

verucha **ssp. n.** (of *Pelatea klugiana*) – Nedoshivina & Zolotuhin 2005 (7.vi.) **28** (1): 3

vestalis Hampson, 1900 (*Pionea*), **syn. n.** of *Epimetasia vestalis* Ragonot, 1894 – Nuss et al. 2006 (14.viii.) **29** (1/2): 38

Victorinella **subgen. n.** of *Victoria* Warren, 1897 (Geometridae) – Hausmann 1996 (21. xi.) **19** (1/2): 38

vigilis Meyrick, 1925 (*Coleophora*), **LT** – J.-F. Landry & Baldizzone 1993 (30.xi.) **16** (2): 130

viktor Yakovlev, 2004 (*Lamellocossus*), **comb. n.**; now: *Acossus* – Yakovlev 2007 (15. xi.) **30** (2): 417

virago Rothschild, 1912 (ssp. of *Bombyx decolorata*), **syn. n.** of *Lasiocampa decolorata decolorata* – Freina & Witt 1983 (30.vi.) **6** (2/3): 96
vivesella **sp. n.** (*Coleophora*) – Baldizzone 1987 (31.iii.) **10** (1): 27
voelkeri Schadewald, 1992 (*Autographa*), **syn. n.** of *Autographa gamma* (Linnaeus, 1758) – Fibiger 1993 (31.vii.) **16** (1): 18

wageneri Koçak, 1976 (ssp. of *Archon apollinus*), **syn. n.** of *Archon apollinus apollinus* (Herbst, 1798) – Freina 1985 (30.vi.) **8** (2): 127
walsinghami **sp. n.** (*Coleophora*) – Baldizzone 1990 (30.ix.) **13** (2/3): 116
walsinghami **sp. n.** (*Episcythris*) – Passerin d'Entrèves 1991 (31.v.) **14** (1): 64
warreni **sp. n.** (*Noctua*) – Lödl 1987 (31.x.) **10** (3): 164
warreni **sp. n.** (*Trichoridia*) – Plante 1990 (31.xii.) **13** (4): 219
wautieri Dufay, 1975 (*Agrochola*), **stat. n.**; now: ssp. of *Agrochola lactiflora* – Hacker & Moberg 1989 (30.vi.) **12** (2): 126
weberella **sp. n.** (*Perittia*) – Whitebread 1984 (30.ix.) **7** (3): 272
weigerti **sp. n.** (*Arctia*) – Freina & Witt 1985 (31.iii.) **8** (1): 21
wertheimsteini Rebel, 1913 (*Cnephasia*), **comb. n.**; now: *Oxypteron* – Razowski 1983 (31.xii.) **6** (4): 234
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